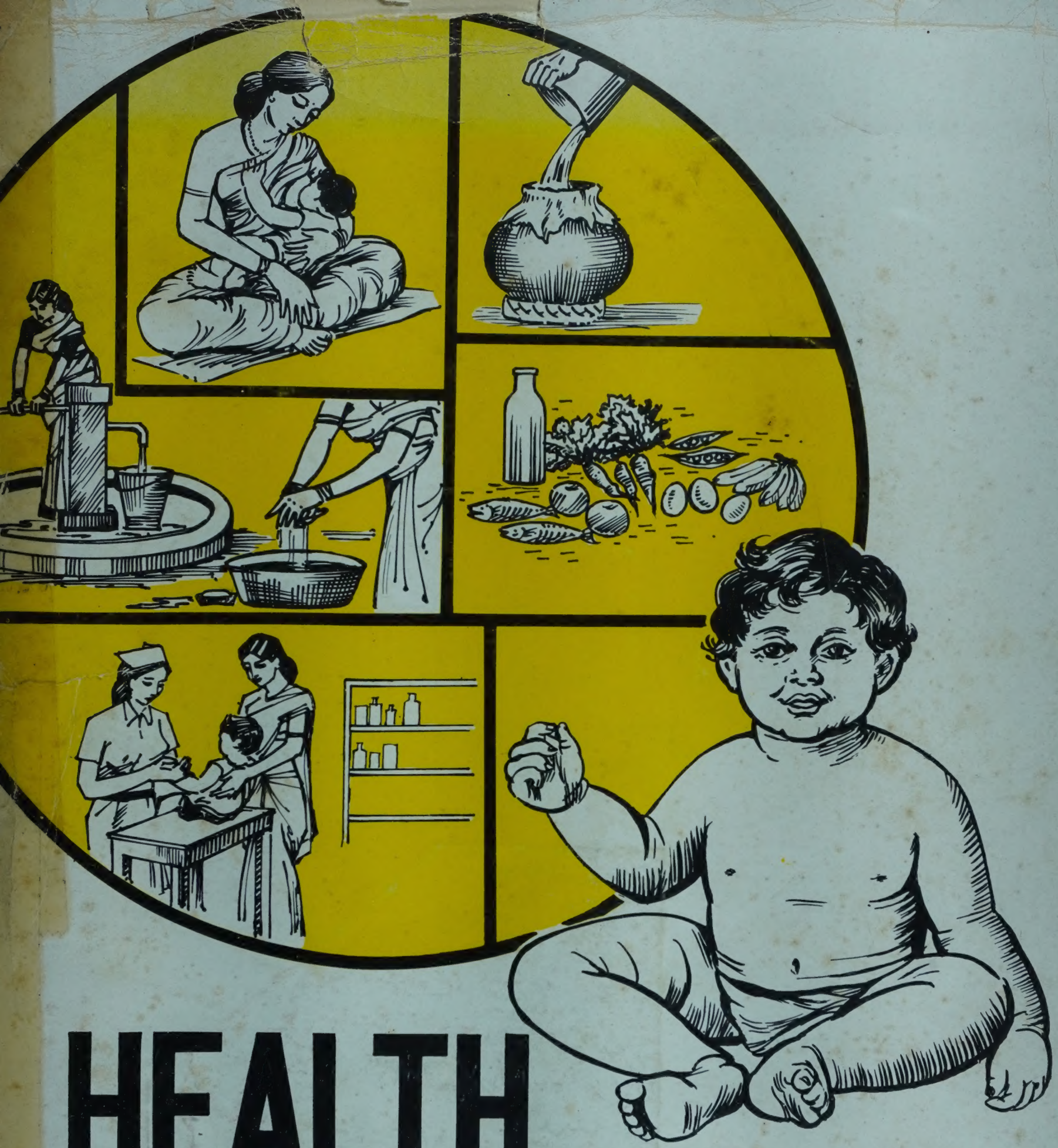
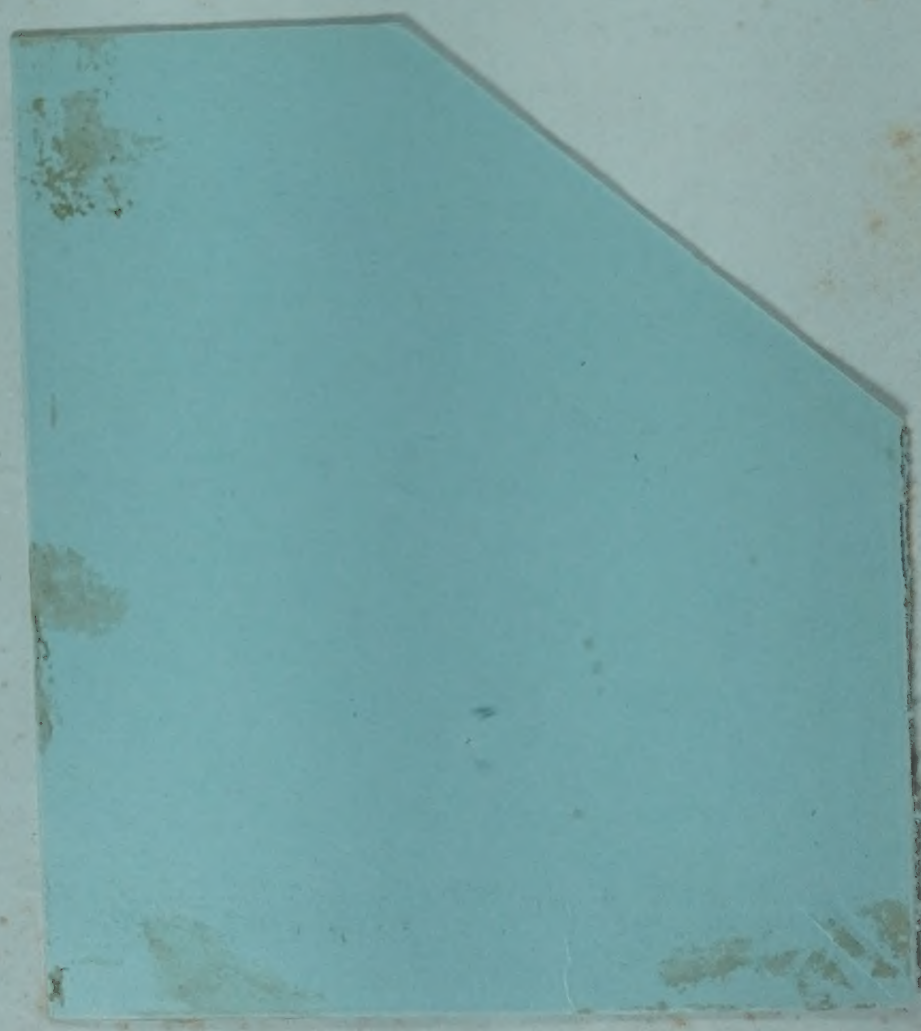


HEALTH BASICS

Compilation of past inserts from Dialogue On Diarrhoea

C. M. A. I. • AHRTAG • UNICEF

03131



Dialogue on Diarrhoea

3131

[illegible] ALTH

HEALTH BASICS

Compilation of past inserts from
Dialogue On Diarrhoea

CMAI AHRTAG UNICEF

03131
CH120

No part of this book should be reproduced except with prior permission of the publisher.

April 1989

Published by
Dr. D. S. Mukarji
General Secretary CMAI
On behalf of Ahrtag London.

Printed in India by
Abhay D. Lawate
Majestic Printing Press
Tilak Statue Mahal NAGPUR – 440 002.

FOREWARD

This publication is a joint effort of AHRTAG, UNICEF and CMAI. It has brought together valuable information on **'Health Basics'** which we hope will be relevant to those involved in primary health care and child survival. It is being made available to health workers in India with a desire to make health a reality for the people of India. We hope that this can help those who are interested in building truly healthy communities.

We look forward to feedback, comments and suggestions.

Dr. Daleep S.Mukarji
General Secretary
CMAI

CHRISTIAN MEDICAL ASSOCIATION OF INDIA
P.BOX NO.24
NAGPUR. M.S. 440 001

Dialogue on Diarrhoea is a quarterly international newsletter which focuses on all aspects of the prevention and treatment of diarrhoeal diseases, and has been published in London by the Appropriate Health Resourses and Technologies Action Group (AHRTAG) since 1980. The newsletter now has a worldwide readership of over 250,000 and is availalble in translation in French, Spanish, Portuguese, Arabic and Tamil editions. Future editions are planned in Bengali and Urdu. Readers who would like to know more about Dialogue on Diarrhoea should write to AHRTAG, 1London Bridge Street. SE1 9SG, U.K.

Health Basics is compiled from a series of inserts that have been included in past issues of Dialogue on Diarrhoea. These pages cover important topics related to primary health care with emphasis on child survival. This booklet has been produced in collaboration with AHRTAG and published by the Christian Medical Association of India with support from UNICEF.

Contents

	Page
Health Basis	
□ Breast Feeding	1
□ Oral Rehydration Therapy	4
□ Growth Monitoring	10
□ Immunisation	16
□ Water & Sanitation	22
□ Weaning	28

HEALTH BASICS: BREASTFEEDING

Photo by João Atílio Moura

Breast is best

- Breastmilk is the best food for your baby. He does not need any other food for the first four months of his life.
- Breastmilk is always clean, ready and warm enough. Night feedings are easy.
- A baby digests breastmilk easily. This means he is more contented and seldom cries.
- Breastfed babies get more protection against diarrhoea, colds, flu and skin problems. For two to three days after you give birth, a special milk (colostrum) comes from your breasts. This colostrum gives your baby special protection.
- Breastfeeding saves you money because you do not need to buy costly artificial milk foods.
- Breastfeeding develops close and loving feelings between baby and mother.

Breast care after birth

Washing

- One wash each day with clean water and no soap is all your breasts need. Do not use soap on the areola because soap dries out the skin. Dryness can cause painful nipples.
- When possible, wash your hands with soap before feedings.

Hardness of breasts

- Frequent breastfeeding in the early days will prevent or reduce hardness of your breasts (engorgement).
- You may have to hand express some milk before a feed. This softens the breast so that the baby can take the areola into his mouth.

If your nipples get sore

- Make sure the baby has nipple and areola well into his mouth.
- Breastfeed more often, at least every two or three hours. This allows you to limit sucking to about ten minutes each side.
- Relax before starting to feed. The milk flows more easily then. Start the flow by hand expressing some milk before the feed.
- Start breastfeeding on the side which is less sore. Sucking is strongest at the beginning of a feed.
- Take the baby off the breast by pressing down on his chin. Never pull him off.
- After the feed, press out a few drops of milk and leave it to dry on the nipple before covering your breast.
- Expose your nipples to the air whenever possible. Also give them five to ten minutes of sun every day if you can.

If you get a lump or sore place in your breast

- Continue to breastfeed very often, in order to keep that breast as empty as possible. Hand express if the baby does not want to suck enough.
- Before feeds, put a warm, wet cloth on the sore place, or soak the breast in a bowl of warm water.
- If you get fever, or if the soreness goes on, go to a doctor or clinic. You should continue to breastfeed frequently, rest, and apply warm cloths while you take the medicine they will give you.
- Remember that sore nipples or a sore breast can get better in a few days. You do not need to give up breastfeeding if you have these problems.

Putting the baby to the breast in a different position can help to ease a sore nipple.

PRODUCED BY DIARRHOEA DIALOGUE WITH THE BREASTFEEDING INFORMATION GROUP, KENYA

HEALTH BASICS: BREASTFEEDING

If you return to work

During maternity leave

- Enjoy complete breastfeeding, whenever the baby is hungry. This increases your milk supply, and breastmilk is all he needs to eat or drink at this time.
- Build up your own health by resting and by eating well.
- Keep giving at least one or two breastfeeds at night, even if it is only last thing and when you wake. The baby can safely be breastfed in bed with you if you wish.

On the days you go to work

- Give the baby a good breastfeed before you go to work, or even two feeds if you can manage. If necessary, wake up the baby for these feeds. He can sleep when you are away.
- If you can come home for lunch, give a breastfeed then. If you must remain at work, hand express as much milk as you can from your breasts. This keeps you comfortable and helps you to keep producing milk.
- Breastfeed again when you return home, and as often as the baby wants during the evening and night. Frequent sucking at these times will increase your milk supply.
- In some countries, where mothers work away from home, babies get most of their milk by breastfeeding at night. This can be useful to know if you must be away in daytimes. Your milk is just as good for baby at night.

On weekends and holidays

- Give the baby breastfeeding only. Your milk will increase with the extra sucking. And you will both enjoy the closeness of these days together.

Teaching your helper

- You will want the baby to be breastfed whenever you are at home. Your helper must learn to keep the baby happy without always feeding him, so he will breastfeed eagerly when you come home. You will need to be very firm about this.
- While you are away, the baby may need some other milk. Your helper should give this from a cup and spoon, not from a bottle. Babies who suck from a bottle often refuse the breast. Also, cup and spoon feeding is cleaner than bottle feeding; it is less likely to cause diarrhoea.
- You should measure the correct amount of cool boiled water and milk powder for the feed, and leave them covered and ready.
- Your helper will mix them just before feeding the baby. She must not mix them up early, or keep what remains for another feed. She must not carry a milk feed out of the house. Artificial milk feed spoils very quickly once it is mixed. The feed should be given all at once, not a little bit now and a little bit later.

Resource list

Contact groups that promote breastfeeding through publications, advice services, campaigns and meetings.

Australia
Nursing Mothers' Association of Australia, P.O. Box 230, Hawthorn, Victoria 3122, Australia.

Kenya
The Breastfeeding Information Group, P.O. Box 59436, Nairobi, Kenya, welcomes letters from people in Africa who would like to be on the IBFAN-Africa mailing list.

Malaysia
The Malaysian Breastfeeding Advisory Association, Persatuan Penasihat Penyusuan Ibu Malaysia, 3rd Floor, 8 Jalan Klyne, Kuala Lumpur 01-21.

Papua New Guinea
Susu Mamas, P.O. Box 5857, Boroko, Papua New Guinea.

Singapore
Singapore Breastfeeding Mothers Group, Consumer Association of Singapore, Trade Union House Annexe, Shenton Way, Singapore 0106.

Trinidad
The Information Breastfeeding Service (TIBS), 14 Eckel Avenue, Maraval, Trinidad, West Indies.

United States
La Leche League International Inc., 9616 Minneapolis Avenue, Franklin Park, Illinois 60131, USA.
Carolyn Tsikouris (foreign groups, Africa, Asia, Middle East) 1039 Brampton Court, Park Forest South, IL 60466, USA.

Books/teaching aids

Breastfeeding Guide
Provides information to prepare health workers for helping mothers to breastfeed successfully. For more information write to UNICEF, P.O. Box 7429 ADC, Pasay City, Philippines.

Breastfeeding in Practice: a manual for health workers
A comprehensive book by Elizabeth Helsing and Felicity Savage King combining practical advice with recent scientific information, aimed primarily at the health worker involved in the promotion of breastfeeding and helping mothers with breastfeeding problems. Available from Oxford University Press, Walton Street, Oxford, UK. Price: £5.95.

Breastfeeding Programme in Brazil
UNICEF News Issue 114, 1982 profiles the Brazilian National Breastfeeding Programme, launched in March 1981. Copies of UNICEF News can be obtained from UNICEF, United Nations, New York, NY, USA.

Suplemento sobre nutricion materno-infantil, lactancia y destete is published three times a year in Spanish, by INCAP, Apartado Postal 1118, Guatemala City, Guatemala. All seven countries in the Central American region are actively promoting breastfeeding; the **Suplemento** profiles the programmes, legislation, training activities and conferences involved in this promotion.

SuPaMINN, published quarterly in English, by the Foundation for the Peoples of the South Pacific, P.O. Box 1493, Suva, Fiji contains information relating to maternal and child nutrition, regional programmes, training and health education; progressive legislation; information sources and new publications.

Why Breastfeed?
A slide set calledy 'Why Breastfeed?' is available from UNICEF, United Nations, New York, NY, USA.

TALC slide set
Teaching Aids at Low Cost (TALC) supply sets about breastfeeding which are available from : TALC, P.O. Box 49, St Albans, Herts, AL1 4AX, UK.

PRODUCED BY DIARRHOEA DIALOGUE WITH SUPPORT FROM THE MRS PLATT-MILLS CHARITABLE TRUST

RESOURCE LIST

BOOKS/MANUALS

Cameron N. **The Measurement of Human Growth.** Available from Croom Helm Ltd., Provident House, Burrell Row, Beckenham, Kent, UK. 1984.

Center for Disease Control and Health Service Administration. **Weighing and Measuring Children: A Training Manual for Supervisory Personnel.** Atlanta, Georgia: Center for Disease Control, 1980.

Hendrata L. and Johnston M. **Manual for Community Based Under-Fives Weighing Programme.** Indonesia: Yayasan Indonesia Sejahtera, 1978

Jelliffe D. B. **Paediatrics in the Tropics.** Available from TALC, 1985.

Jelliffe D. B. **The Assessment of the Nutritional Status of the Community.** WHO. 1966.

Morley D. and Woodland M. **See How They Grow: Monitoring Child Growth for Appropriate Health Care in Developing Countries.** New York: Oxford University Press, 1979.

Tinibu A. **Weight Charting and Its Significance in Child Health.** Chapel Hill, NC: University of North Carolina, African Health Training Institutions Project, 1978.

Werner D. **Helping Health Workers Learn: A Book of Methods, Aids and Ideas for Instructions at the Village Level.** Palo Alto: Hesperian Foundation, 1982.

World Health Organization: **Growth Charts and Home Based Child's Records in Maternal and Child Health Care.** An Appropriate Approach and Reference Manual for their Evaluation. 1985. Available from WHO.

World Health Organization Offset. **Guidelines for Training Community Health Workers in Nutrition.** 2nd ed. 1986. Publication No. 59.

ARTICLES

Kielmann A. and McCord C. **Weight-for-Age as an Index of Risk of Death in Children.** Lancet, 1 (1978). p. 1247+

Nabarro D. and McNabb S. (1980), **A Simple New Technique for Identifying Thin Children.** Journal of Tropical Medicine and Hygiene 83, 21-33.

Seone N. and Latham M. **Nutritional Anthropometry in the Identification of Malnutrition in Childhood.** Journal of Tropical Paediatrics and Environmental Child Health, 17 (1971). p. 98+

SOURCES OF INFORMATION AND/OR EQUIPMENT

Academy for Educational Development (AED), 1414 22nd Street, N.W., Washington D.C. 20037, U.S.A.

Agency for International Development (AID), Office of Nutrition, Bureau of Science and Technology, Agency for International Development, Washington D.C. 20523, U.S.A.

American Public Health Association (APHA), Clearinghouse on Infant Feeding and Maternal Nutrition, 1015 15th Street, NW., Washington D.C. 20005, U.S.A.

AMREF, PO Box 30125, Nairobi, Kenya.

CMS Weighing Equipment Ltd., 18 Camden High Street, London, NW1 0JH. U.K.

Department of Human Nutrition, London School of Tropical Medicine and Hygiene, Keppel Street, (Gower Street), London, WC1E 7HT, U.K.

Departments of Tropical Paediatrics and International Community Health, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool, L3 5QA, U.K.

Hesperian Foundation, PO Box 1692, Palo Alto, California 94302, U.S.A.

Institute of Child Health, Tropical Child Health Unit, 30 Guilford Street, London, WC1, U.K.

National Center for Health Statistics, (NCHS), 3700 East-West Highway, Center Building 1-57, Hyattsville, MD 20782, U.S.A.

OXFAM, Medical Unit, 274 Banbury Road, Oxford OX2 7DZ, U.K.

Pan American Health Organization (PAHO), 525 23rd Street, N.W., Washington D.C. 20037, U.S.A.

Program for Appropriate Technology in Health (PATH), Canal Place, 130 Nickerson Street, Seattle, Washington 98109, U.S.A. 98109, U.S.A.

Salter Abbey, St Botolph's Lane, Bury-St Edmunds, Suffolk, U.K.

Salter Industrial Measurement Limited, George Street, West Bromwich, West Midlands, B70 6AD, U.K.

Save the Children Fund, (UK), 17 Grove Lane, London, SE5 8RD, U.K.

Teaching Aids at Low Cost (TALC), PO Box 49, St. Albans, Herts AL1 4AX, U.K.*

United Nations Children's Fund (UNICEF), United Nations, T-Plaza 4-1234C, New York, NY 10017, U.S.A.

UNIPAC, UNICEF Procurement and Assembly Centre, UNICEF Plaus, Freeport — DK 2100, Copenhagen O, Denmark.

Voluntary Health Association of India (VHAI). C-14, Centre S.D.A., New Delhi 110016, India.

World Health Organization, Distribution and Sales Service, 1211 Geneva 27, Switzerland.

Cautionary note

It must be stressed that the practical benefits of growth monitoring in promoting better nutritional status and child health are wholly dependent on effective follow-up action being taken by mothers and health workers. This means that:—

- **mothers must be motivated and enabled to acquire the necessary skills and resources to take action;**
- **any advice that is given to mothers must be culturally appropriate and compatible with the resources that exist within the home and;**
- **basic health services must be readily available, including the provision of vaccines, drugs and oral rehydration fluids.**

Current experience suggests that growth monitoring programmes are not always fulfilling these prerequisites and consequently are not achieving the desired impact on child health. It is feared that this could lead to a backlash of disillusionment with growth monitoring *per se* and it is therefore urged that growth monitoring should not be instituted unless the proper infrastructure is in place to permit effective follow-up action. Reference: Ashworth, A. and Feachem, R.G. Interventions for the control of diarrhoeal diseases among young children: growth monitoring programmes. Document CDD/86. Geneva: World Health Organization, 1986.

ACKNOWLEDGEMENT

Much of the information contained in this insert is based on material from the World Federation of Public Health Association's information for action issue paper *'Growth Monitoring of Preschool Children: Practical Considerations for Primary Health Care Projects.'* 1985. Griffiths M.

More detailed information concerning manufacturers of growth monitoring equipment, costs, availability, etc., is available from AHRTAG, 1 London Bridge Street, London SE1 9SG, U.K.

HEALTH BASICS: ORAL REHYDRATION THERAPY

ORAL REHYDRATION THERAPY

Oral Rehydration Therapy (ORT) is the cheap, simple and effective way to treat dehydration caused by diarrhoea. When diarrhoea occurs, essential fluids and salts are lost from the body and must be quickly replaced. Many of the millions of children who die every year in developing countries from diarrhoea could be saved if they were given ORT promptly. This includes giving extra fluids at home such as tea, soups, rice water and fruit juices to prevent dehydration, and the use of oral rehydration salts (ORS) solution to treat dehydration. Made up with clean water the ORS drink contains the main elements that are lost from the body during diarrhoea. It is effective in treating dehydration resulting from all types of acute diarrhoeal diseases.

Many countries now have diarrhoeal disease control programmes, but ORT is still not nearly as widely used as it should be and more effective information dissemination and promotion of ORT is necessary.

This leaflet

This leaflet answers some of the most common questions asked about ORT and we hope that it will be useful. Please send us any comments about your own work with ORT.

What is dehydration?

Dehydration is the loss of water and body salts through diarrhoea. Early features are difficult to detect but include dryness of mouth and thirst. The signs of dehydration include: sunken fontanelle (in infants); fast, weak pulse; breathing faster than normal; loss of skin elasticity; sunken, dry eyes and reduced amount of urine. Rehydration is the correction of dehydration.

What is ORT?

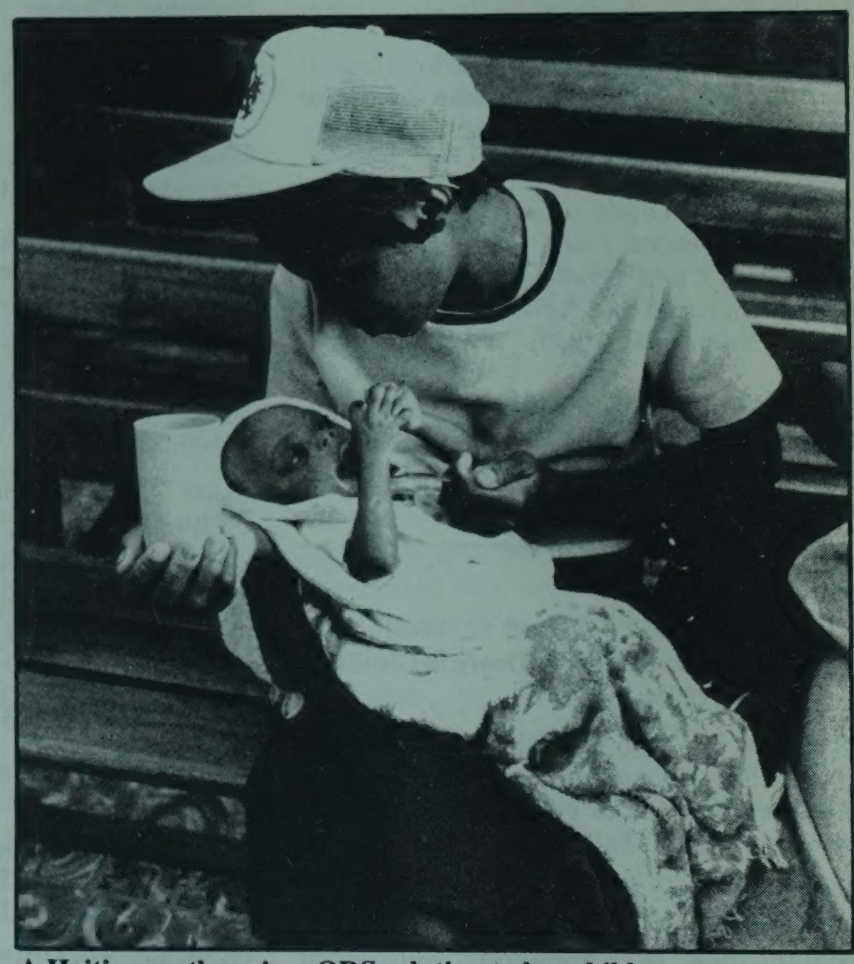
ORT is the giving of fluid by mouth to prevent and/or correct the dehydration that is a result of diarrhoea. As soon as diarrhoea begins, treatment using home remedies to *prevent* dehydration must be started. If adults or children have not been given extra drinks, or if in spite of this dehydration does occur, they must be treated with a special drink made with oral rehydration salts (ORS). The formula for ORS recommended by WHO and UNICEF contains:

3.5 gms sodium chloride
2.9 gms trisodium citrate dihydrate (or 2.5 gms sodium bicarbonate)
1.5 gms potassium chloride
20 gms glucose (anhydrous)

The above ingredients are dissolved in one litre of clean water. WHO has recently recommended a change in the complete formula, replacing 2.5 gms of sodium bicarbonate with 2.9 gms of trisodium citrate dihydrate. The new formula gives the packets a longer shelf life and is at least as effective in correcting acidosis and reducing stool volume. Packets containing sodium bicarbonate are still safe and effective.

How does ORT work?

Acute diarrhoea normally only lasts a few days. ORT does not stop the diarrhoea, but it replaces the lost fluids and essential salts thus preventing or treating dehydration and reducing the danger. The glucose contained in ORS solution enables the intestine to absorb the fluid and the salts more efficiently. ORT alone is an effective treatment for 90–95 per cent of patients suffering from acute watery diarrhoea, regardless of cause. This makes intravenous drip therapy unnecessary in all but the most severe cases.



UNICEF photo by Nicole Toutounji

A Haitian mother gives ORS solution to her child.

Can ORS be used for everyone?

ORT is safe and can be used to treat anyone suffering from diarrhoea, without having to make a detailed diagnosis before the solution is given. Adults need rehydration treatment as much as children, although children must always be treated immediately because they become dehydrated more quickly.

USING ORT TO PREVENT AND TREAT DEHYDRATION

Preventing dehydration

Mothers must learn:

- *to respond to diarrhoea immediately by giving extra suitable drinks* (see paragraph on home solutions below).
- *to recognize the signs of dehydration which need ORS or special care.*

If ORT is given at home early on, dehydration can often be prevented and many children will not become so ill that they need to see a health worker.

Home drinks to prevent dehydration

- Mothers can use household liquids, preferably those that have been boiled, such as rice water or carrot soup. Ideally these drinks should contain starches and/or sugars as a source of glucose and energy, some sodium and preferably some potassium.
- A simple salt/sugar solution, if these ingredients are available, is also suitable for early oral rehydration therapy. 1 level teaspoon (5 ml) of salt should be mixed with 8 level teaspoons of sugar in a litre of drinking water. Cooking salt can be used for this, but rock salt does not work as well because it will not dissolve easily. Molasses and other forms of raw sugar can be used instead of white sugar, and these contain more potassium than white sugar. *Do not use too much salt.* If the solution has too much salt the child may refuse to drink it. Also, too much salt can, in extreme cases, cause convulsions. Too little salt does no harm but is less effective in preventing dehydration. (A rough guide to the amount of salt is that the solution should taste no saltier than tears.)

Measuring home solutions

Different countries and different communities use various methods for measuring the salt and sugar. Finger pinch and hand measuring, and the use of local teaspoons can be taught successfully. A plastic measuring spoon is available from Teaching Aids at Low Cost (TALC) with proportions to make up 200 ml of sugar/salt solution. Whatever method is used, people need to be carefully instructed in how to mix and use the solutions.

WHAT TO DO IF DEHYDRATION OCCURS

If, despite extra home drinks, dehydration occurs, or the diarrhoea continues for more than two days, the child should be taken to see a health worker to be given *ORS solution*.

How to assess the degree of dehydration

The table below describes what the health worker should ask and look for, and indicates which treatment plan to follow.

1. ASK ABOUT:	DIARRHOEA	Less than 4 liquid stools per day	4 to 10 liquid stools per day	More than 10 liquid stools per day	Longer than 3 weeks duration (chronic diarrhoea)
	VOMITING	None or a small amount	Some	Very frequent	Blood or mucus in the stool
	THIRST	Normal	Greater than normal	Unable to drink	
	URINE	Normal	A small amount, dark	No urine for 6 hours	
2. LOOK AT:	CONDITION	Well, alert	Unwell, sleepy or irritable	Very sleepy, unconscious, floppy or having fits	Severe undernutrition
	TEARS	Present	Absent	Absent	
	EYES	Normal	Sunken	Very dry and sunken	
	MOUTH and TONGUE	Wet	Dry	Very dry	
	BREATHING	Normal	Faster than normal	Very fast and deep	
3. FEEL:	SKIN	A pinch goes back quickly	A pinch goes back slowly	A pinch goes back very slowly	
	PULSE	Normal	Faster than normal	Very fast, weak, or you cannot feel it	
	FONTANELLE (in infants)	Normal	Sunken	Very sunken	
4. TAKE TEMPERATURE					High fever – 38.5°C (or 101°F) or greater
5. WEIGH IF POSSIBLE		No weight loss during diarrhoea	Loss of 25–100 grams for each kilogram of weight	Loss of more than 100 grams for each kilogram of weight	
6. DECIDE		The patient has no signs of **dehydration** **Use Plan A**	If the patient has 2 or more of these signs, he has **some dehydration** **Use Plan B**	If the patient has 2 or more of these danger signs, he has **severe dehydration** **Use Plan C**	If the patient has chronic diarrhoea, severe undernutrition, or high fever treat or refer to the nearest health clinic for treatment. If there is blood or mucus in the stool and high fever, suspect dysentery and treat with antimicrobials.

PLAN A: NO DEHYDRATION *

The health worker should discuss home drinks with the mother (see pages 1 and 3), feeding during diarrhoea and proper home hygiene. The mother should be given enough ORS packets for two days if:

- her child has been on Plan B.
- it is national policy to give ORS solution to all children who visit a health centre for diarrhoea treatment.
- the mother cannot come back if the diarrhoea gets worse.

Mothers given ORS packets to use at home must be carefully shown how to use them. The amount of ORS solution she should give is:

AFTER EACH LOOSE STOOL:

- 50–100 ml (¼–½ cup) of ORS solution for a child less than 2 years old.
- 100–200 ml for older children. Adults can take as much as they want.

NOTE: Children receiving ORS solution must also be given the usual amount of ordinary drinks they take each day. *They should not also be given salt and sugar solution.*

PLAN B: FOR SOME DEHYDRATION *

1. USE THIS TABLE TO SEE HOW MUCH ORS SOLUTION IS SUITABLE FOR 4–6 HOURS TREATMENT:

Patient's weight in kilograms		3 5 7 9 11 13 15 20 30 40 50					
Patient's age *		2 4 6 8 10 12 18 2 3 4 6 8 15 adult months → ← years →					
Give this much solution for 4–6 hours	in ml:	200–400	400–600	600–800	800–1000	1000–2000	2000–4000
	in local unit of measure:						

* Use the patient's age only when you do not know the weight.

If the patient wants more ORS solution, give more. If the eyelids become puffy, stop and give other fluids. Use ORS solution again when the puffiness is gone.
If the child vomits, wait 10 minutes and then continue slowly giving small amounts of ORS solution.

2. IF THE MOTHER CAN REMAIN AT THE HEALTH CENTRE

- tell her how much ORS solution to give her child
- show her how to give it
- watch her give it

3. AFTER 4–6 HOURS REASSESS THE CHILD. THEN CHOOSE THE SUITABLE TREATMENT PLAN.

NOTE: FOR CHILDREN UNDER 12 MONTHS CONTINUING TREATMENT PLAN B AFTER 4–6 HOURS, TELL THE MOTHER TO GIVE:

- breastmilk feeds between drinks of the ORS solution, or
- 100–200 mls of clean water before continuing ORS if she does not breastfeed her child.

4. IF THE MOTHER MUST LEAVE ANY TIME BEFORE COMPLETING TREATMENT PLAN B, TELL HER:

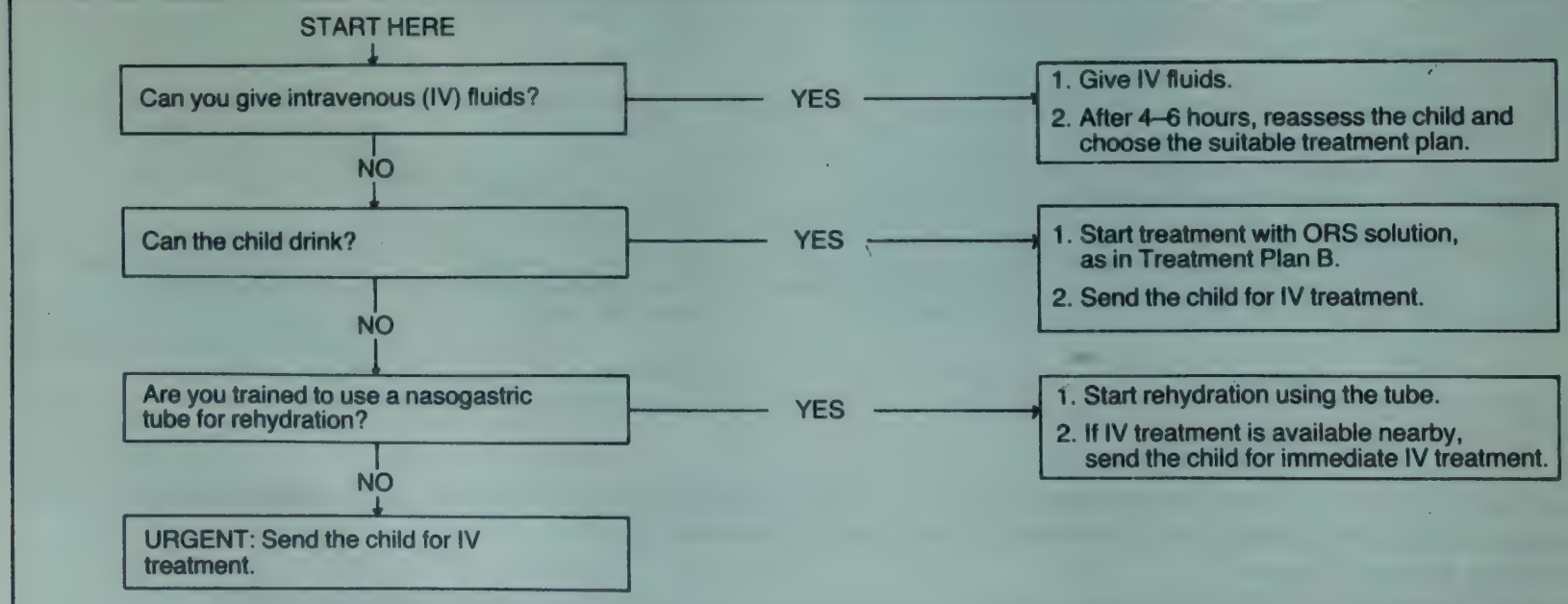
- to finish the 4–6 hour treatment as in 1. above
- to give the child as much ORS solution as he wants after the treatment
- to look for the signs of dehydration and, if the child has any, to return the next morning.

Give her enough ORS packets for 2 days and show her how to prepare ORS solution.

Explain briefly how to prevent diarrhoea.

PLAN C: FOR SEVERE DEHYDRATION *

Follow the arrows. If the answer to the question is 'yes', go across. If it is 'no', go down.


START HERE
Can you give intravenous (IV) fluids?
YES
1. Give IV fluids.
2. After 4–6 hours, reassess the child and choose the suitable treatment plan.
NO
Can the child drink?
YES
1. Start treatment with ORS solution, as in Treatment Plan B.
2. Send the child for IV treatment.
NO
Are you trained to use a nasogastric tube for rehydration?
YES
1. Start rehydration using the tube.
2. If IV treatment is available nearby, send the child for immediate IV treatment.
NO
URGENT: Send the child for IV treatment.

NOTE: If there is a high fever, show the mother how to cool the child with a wet cloth and fanning.

What should be done if the child vomits?

Vomiting does not usually prevent the therapy from being successful. Mothers must be taught to persist in giving ORS solution, even though this requires time and patience. *They should give regular, small sips of fluid*. Giving ORT reduces nausea and vomiting and restores the appetite through correction of acidosis and potassium losses.

Should feeding continue at the same time as ORT?

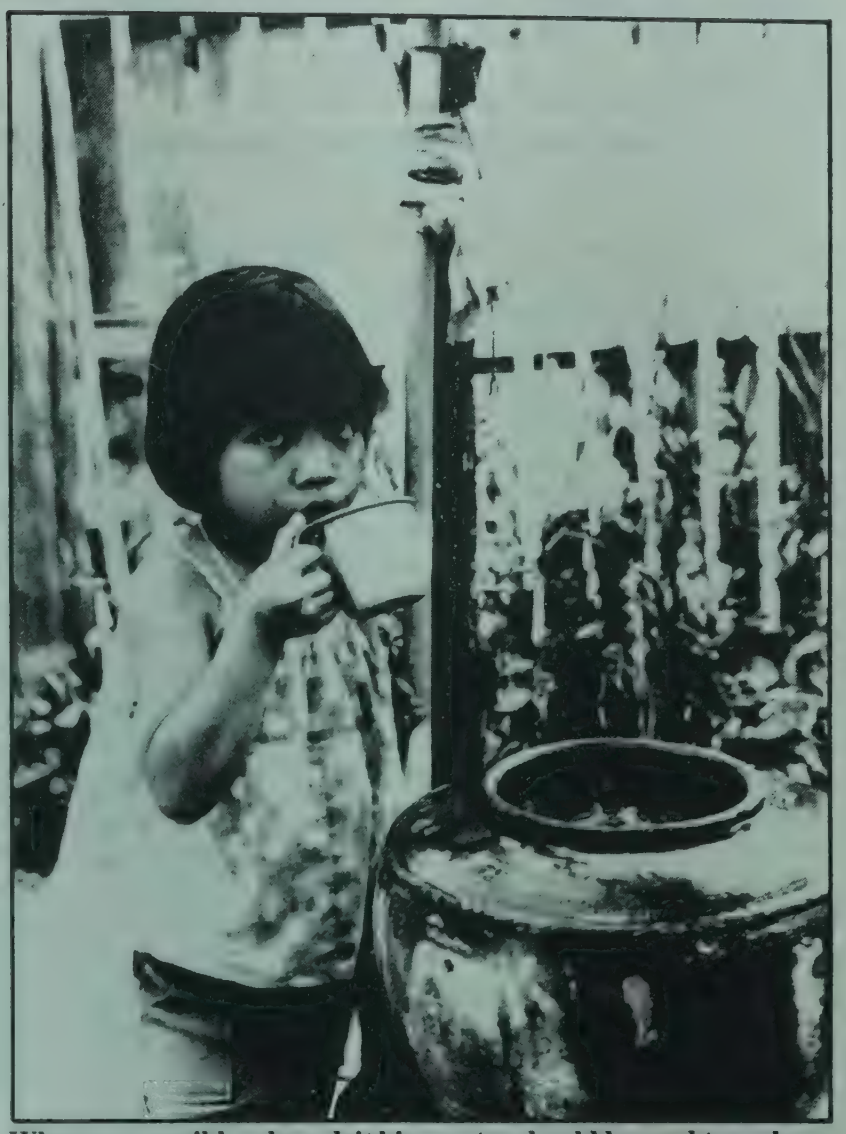
Feeding, especially breastfeeding, should be continued once dehydration has been corrected. Even if the diarrhoea continues or the child is vomiting, some of the nutrients are being absorbed. Suitable food should not be withheld, as the child may become malnourished. Once the diarrhoea episode has passed, the child should be given more food than usual to make up for losses during diarrhoea. Breastfeeding is particularly beneficial because breastmilk is easily digestible. It also contains protective substances which help to overcome the infection causing the diarrhoea.

What sort of foods are good during diarrhoea?

- High energy foods such as fats, yoghurt and cereals are quite well absorbed during diarrhoea. Small, frequent feeds of energy-rich local foods familiar to the child should be given. A little vegetable oil can be added to foods such as millet or rice to increase the energy content.
- Foods high in potassium are important to restore the body's essential stores depleted during diarrhoea. Such foods include lentils, bananas, mangoes, pineapples, pawpaw, coconut milk and citrus fruits.
- Certain foods should be avoided during diarrhoea, for example those containing a lot of fibre such as coarse fruits and vegetables, wholegrain cereals and spicy foods.

WHO photo

Small, frequent feeds of energy-rich local foods should be given during diarrhoea.



WHO photo

Wherever possible, clean drinking water should be used to make up oral rehydration solution.

Is it necessary to use drugs as well as ORT?

Drugs should not be used except in the *most severe* cases. Even then they should be administered with care, preferably after the organism causing the diarrhoea has been identified. Small children with dysentery and fever require an antibiotic. Refer such patients to a health service for advice. ORT on its own is usually enough to rehydrate the child. Unnecessary antibiotic therapy upsets the normal bacteriological balance of the intestine. Many anti-diarrhoeal preparations have proved to be either ineffective or too powerful for very small infants.

Can the solution be made with dirty water?

The benefits of fluid replacement in diarrhoea far outweigh the risks of using contaminated water to make up oral rehydration solution. In situations where it is difficult to boil water, mothers are advised to use the cleanest water possible.

Can ORS solution be stored?

Generally a made-up solution should be covered and not kept for more than 24 hours, due to the risk of bacteriological contamination. Packets of ORS should be stored carefully and not kept in temperatures of over 30°C or in conditions of high humidity. Where the ingredients to make up ORS are being stored in bulk the glucose/sucrose should be kept apart from the rest of the dry ingredients. The new citrate formula ORS has a longer shelf life.

**Treatment plans on pages 4, 5 and 6 taken from the CDD/ WHO Supervisory Skills course, from the module on the treatment of diarrhoea.*

ORT: COUNTRY EXAMPLES

Trinidad and Tobago

"In 1980, the Ministry of Health began a programme with the help of the International Development Research Centre (IDRC) to promote ORT in Port-of-Spain. At that time, a third of all infant mortality was due to dehydration from diarrhoea. In 1981, an oral rehydration therapy unit was opened in the main hospital, run by nursing staff who had been trained by a paediatrician from the University of the West Indies. The unit was open daily and treated cases of mild to moderate dehydration using the locally produced ORS-GESOL. Mothers were also given advice on using ORT at home, and about feeding and diarrhoea. Some objections were raised to the leading role played by the nurses in the unit – who only referred patients to doctors when they thought it necessary. However, these attitudes changed when the success of the programme became clear. Over a six month period there were 540 admissions to the unit and only 20 of these were unsuccessfully treated. The oral rehydration programme also greatly reduced the number of admissions and deaths in the gastroenterology ward. The nursery in the ward has now been closed. The ORT facilities are now available all over the island and a massive health education programme is continuing to promote the message of ORT . . ."

India

"In Narangwal, deaths in children aged between 8 days and three years have been reduced by half through community workers using only oral rehydration therapy and penicillin . . ."

Ethiopia

"Since the Ethiopian national programme began in 1980, more than 50 CDD managers have been trained successfully. Future plans include the establishment of an ORT training centre in Addis Ababa, with UNICEF support, the training of more than 300 nurses in diarrhoea management and supervisory skills, and the local production of ORS. The Programme's overall impact will be assessed in 1985 . . ."

The Gambia

"The role of oral rehydration therapy in diarrhoeal disease control has been emphasized at two levels by the Gambian government. Health workers have been taught to administer ORT using oral rehydration salts, and mothers have been taught to mix a safe sugar-salt solution at home. The message has been successfully reinforced by a media campaign – after one year 67 per cent of mothers could correctly mix a home solution and 47 per cent had used it once or more to treat their children. Not surprisingly, this early preventive treatment at home has led to a drop in the number of mothers taking children with diarrhoea to health centres from 85 per cent to 50 per cent . . ."

Philippines

"The National ORT programme was introduced in the Philippines after encouraging field trials. ORT was accepted by mothers who saw the beneficial results of using it. An early problem was finding an easily available measuring device – initially local beer bottles were used as they were found in most homes. Later a drinking glass, originally the container for a popular brand of coffee, was found to be more practical. Good overall co-ordination of the national programme was essential to its success. Problems arose in the early stages when, for example, packets of salts were delivered without proper instruction to mothers by staff who were not trained properly . . ."

HEALTH BASICS: ORT RESOURCE LIST

Publications and newletters

The Management of Diarrhoea and use of Oral Rehydration Therapy – A Joint WHO/ UNICEF Statement, 1983. Available from WHO and UNICEF (see list of addresses).* Free.

Oral Rehydration Therapy (ORT) for Childhood Diarrhoea, 1984. (Revised edition). Population Reports, Series L, No. 2, Issues in World Health. Available from Population Information Programme, John Hopkins University, USA (see list of addresses). Free.

Proceedings of the International Conference on Oral Rehydration Therapy (ICORT), 1983. Available from the United States Agency for International Development (see list of addresses). Free.

Oral rehydration therapy – Information for Action Resource Guide, 1983. Prepared for UNICEF by the World Federation of Public Health Associations (see list of addresses).

Journal of Diarrhoeal Diseases Research. Published quarterly by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). Cost US$15.00 to developing countries for four issues. (see list of addresses for ICDDR,B details).

WHO Training Materials*

A Manual for the Treatment of Acute Diarrhoea – for use by physicians and other senior health workers.

Guidelines for the Trainers of Community Health Workers on the Treatment and Prevention of Acute Diarrhoea.

**For a full list of all WHO materials on clinical management of diarrhoea, training, development of diarrhoeal disease control programmes etc. write to the Director of the CDD Programme at the address given on the resource list.*

Bibliographies

Resource Guide on Oral Rehydration Therapy, 1983. US $5.00 (prepaid, airmail). World Federation of Public Health Associations. Available from the American Public Health Association (see list of addresses).

Oral Rehydration Therapy: An Annotated Biblography, 1983. Scientific Publication No. 445. Pan American Health Association. (Second edition). (see list of addresses).

AHRTAG
Appropriate Health Resources & Technologies Action Group Ltd

This insert has been produced by Diarrhoea Dialogue with support from OXFAM

OXFAM

Newsletters

Diarrhoea Dialogue. Quarterly newsletter on all aspects of the prevention and control of diarrhoeal diseases. Available in English, Spanish, French, Portuguese and Arabic. Order from AHRTAG, UK. (See list of addresses.)

Glimpse. A newsletter reporting on the activities at ICDDR,B. Published 8 times a year. Free. (See list of addresses.)

Mothers and Children. Published three times a year in English, French and Spanish. Free to developing countries/ US$5.00 to others. Available from American Public Health Association, USA. (See list of addresses.)

Salubritas. Published quarterly in English at US$10.00 year. Update on community health resource material. Available from American Public Health Association, USA. (See list of addresses.)

World Neighbours in Action. Quarterly 'how-to-do it' newsletter on primary health care published by World Neighbours. (See list of addresses.)

Oral Rehydration: Bulletin of the Oral Rehydration Scheme of RUHSA. Published bi-monthly by RUHSA, Christian Medical College, Vellore, P.O. Tamil Nadu 632 209, India.

Health education and teaching aids

Diarrhoeal Diseases Control: Examples of Health Education Materials 1982. WHO/ CDD. Examples of posters, flashcards and leaflets from diarrhoeal disease control worldwide.

Medex Workbook for Community Health Workers, No. 32: **Prevention and Care of Diarrhoea. 1983.** (US$5.80, inc. surface mail. Available from The Medex Group – see address section).

Helping Health Workers Learn. Available from TALC, UK and the Hesperian Foundation, USA. (See list of addresses.)

Specific country materials

Bangladesh: **Manual on Treatment and Prevention of Diarrhoea. 1980.** International Centre for Diarrhoeal Diseases Research, Bangladesh. (See address section.)
Small training manual and flipchart for CHWs.

The Gambia: **Health Workers Manual for the Management of Acute Diarrhoea in the Gambia. December 1981.** Health Education Unit, Department of Medical and Health Services, Banjul, The Gambia.

India: **Better Care During Diarrhoea.** Voluntary Health Association of India (see address section)
Small booklet about diarrhoea and dehydration for CHWs. Well illustrated with photographs. Gives teaching advice and health messages.

Indonesia: **Lina Regains her health with Sugar and Salt Solution.** Save the Children Fund, USA (see address section). Pamphlet and flip chart.

Jamaica: **What to do when your baby has diarrhoea. 1982.** Ministry of Health, P.O. Box 478, Kingston, Jamaica.

Liberia: **Caring for Children and Diarrhoea.** UNICEF/Inservice Education Division, Ministry of Health and Social Welfare, P.O. Bag 9009, Monrovia, Liberia.

Nicaragua: **Diarrhoea control and prevention material: Jornadas Populares de Salud,** Ministerio de Salud Publica, Managua, Nicaragua. In Spanish.

Zambia: **Special position paper on Nutrition and Diarrhoea.** Health Education Unit, P.O. Box 30205, Lusaka, Zambia.

Sources of information

Code: Development of diarrhoeal disease control programmes (D) Health education and information (H) Training (T) Operational and applied research (R) Supply and distribution of ORS (S)

- **Academy for Educational Development (AED)** (H) (T)
Contact: Dr William Smith
1414 22nd Street, N.W.
Washington D.C. 20037
USA

- **Agency for International Development (AID)** (D) (H) (T) (R) (S)
Contact: Mr Robert Clay
Office of Health
Bureau for Science and Technology
Agency for International Development
Washington D.C. 20523

- **American Public Health Association (APHA)** (H)
Contact: Gayle Gibbons
Clearinghouse on Infant Feeding and Maternal Nutrition
1015 15th Street, N.W.
Washington D.C. 20005
USA

- **Appropriate Health Resources and Technologies Action Group (AHRTAG)** (H)
Contact: Denise Ayres
85 Marylebone High Street
London W1M 3DE
UK

- **Diarrhoeal Diseases Control Programme (CDD)** (D) (H) (T) (R) (S)
Contact: Dr M H Merson
World Health Organization
1211 Geneva 27
Switzerland

- **The Hesperian Foundation** (H)
Contact: Dr David Werner
P.O. Box 1692
Palo Alto
California 94302
USA

- **International Centre for Diarrhoeal Diseases Research, Bangladesh (ICDDR,B)** (H) (T) (R)
Contact: Dr W B Greenough III
P.O. Box 128
Dhaka
Bangladesh

- **The Medex Group** (H) (T)
Health Manpower Development Staff
John A Burns School of Medicine
University of Hawaii
1960 East-West Road
Honolulu
Hawaii 96822
USA

- **Pan-American Health Organization (PAHO)** (D) (H) (T) (R) (S)
Contact: Mr C Drasbek
525 23rd Street, N.W.
Washington D.C. 20037
USA

- **Population Information Programme** (H) (T)
The John Hopkins University
Hampton House
624 North Broadway
Baltimore
Maryland 21205
USA

- **Program for Appropriate Technology in Health (PATH)** (H) (T) (S)
Contact: Vivien Tsu
Canal Place
130 Nickerson Street
Seattle
Washington 98109
USA

- **Ross Institute of Tropical Hygiene** (D) (H) (T)
Contact: Richard Feachem
London School of Tropical Medicine and Hygiene
Keppel Street (Gower Street)
London WC1E 7HT
UK

- **Save the Children Federation** (H)
48 Wilton Road
Westport
CT 06880
USA

- **Teaching Aids at Low Cost (TALC)** (H)
Contact: Mrs B Harvey
P.O. Box 49
ST Albans
Herts AL1 4AX
UK

- **United Nations Children's Fund (UNICEF)** (D) (H) (S)
Contact: Mr R Goodall
United Nations
T-Plaza 4-1234 C
New York, NY 10017
USA

- **Voluntary Health Association of India (VHAI)** (H) (T)
C14 Community Centre
Safdarjang Development Area
New Delhi 110016
India

- **World Neighbors** (H)
5116 N Portland
Oklahoma City
OKA 73112
USA

HEALTH BASICS: GROWTH MONITORING

This insert gives a brief overview of practical considerations for growth monitoring: what to measure, how to measure, and types of equipment available for measuring growth. For a discussion of growth monitoring issues, please see the article by Dr David Nabarro in *DD 23* and page 4 of *DD 24*.

WHY MEASURE GROWTH?

For a relatively small expenditure per child, growth monitoring can greatly strengthen preventive health programmes. Growth is the best general index of the health of an individual child, and regular measurements of growth permit the early detection of malnutrition, frequently associated with diarrhoea, and other illnesses, when remedial action is relatively easy. Although acute signs of malnutrition are easily noted by health workers, it is often too late, and always more expensive, to help the severely malnourished child. For early detection of children with growth retardation and high risk of malnutrition and mortality, health workers need special tools and training in growth monitoring. The growth status of children is a measure of the health and well-being of the whole community. (Birth weight is of particular significance in determining the nutritional status of a community: low birth weight is a good indicator of subsequent illness and death in children.)

Key issues to consider when setting up a growth monitoring programme:

- what equipment is required?
- who will use the equipment and where?
- what will be done with the results?
- what is the programme's objective?

Problems associated with growth monitoring programmes include:

- lack of understanding on the part of health workers about the role of growth monitoring; many existing training methods only look at teaching the skills of growth chart completion or checking it for errors;
- lack of involvement of mothers in monitoring the growth and development of their children;
- lack of commitment of senior health personnel to the monitoring of children's growth and development;
- lack of planning and facilities when children with growth faltering are detected.

Photo by William Cutting

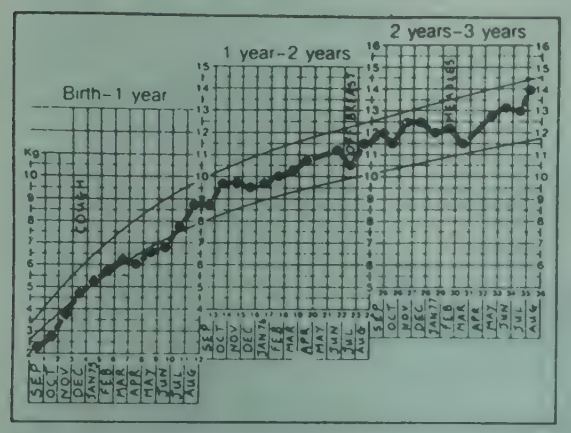
WHAT TO MEASURE

Various body measurements are used to assess growth. Some are easier to use, more accurate and more useful than others. Monitoring the growth of a child usually requires taking the same measurements at regular intervals and seeing how they change. A single measurement only indicates the child's size at that moment; it does not give any information about whether a child's size or weight is increasing, staying the same, or declining. Careful repeated measurements and comparisons with previous measurements are necessary because most children will continue to grow a little, unless they are very ill, and it is easy to mistake some growth for adequate growth. Growth measures are usually compared to a reference population. Gathering data to establish a local reference population is a major undertaking. Therefore, western standards are usually used for comparison, such as Tanner and Boston, or more recently, those of the National Centre for Health Statistics (NCHS).

Weight-for-age

To obtain weight-for-age, the weight of the child (in kgs) is compared with that of a healthy normal child of the same age from a reference population. This is the basis of the weight-for-age or Gomez classification of nutritional status. A child weighing less than 60 per cent of the reference weight-for-age is considered to be severely malnourished.

Looking at the current weight of a child in isolation is not very useful. Most methods of growth monitoring, including weight-for-age, use a chart on which a child's weight is plotted at intervals, ideally monthly, from birth to five years of age. (Some programmes focus on children aged between 6 and 36 months, since this group is at greatest risk from growth faltering — poor weight gain, or weight loss.) It is the direction of the growth curve on the chart that is crucial, and a child whose growth curve shows a levelling off or flattening needs help. A falling weight curve is a more urgent sign for investigation and help. It is better to use weight-for-age in children aged 0 to 2 years than other anthropometric measures, because weight is a more sensitive indicator during this period than height.



The child whose growth is depicted on this chart made good progress, despite set-backs at the time of coming off the breast and after a bout of measles. Weight loss was not allowed to continue once it had been detected by the chart.

Source: See How They Grow by David Morley and Margaret Woodland, Macmillan Tropical Community Health Manual, 1979.

Advantages of weight-for-age as a monitor of growth

- It is considered to be a useful indicator for growth monitoring in general terms.
- It is sensitive to small changes in the child's nutritional status, as reflected by weight and is a good indicator for detecting growth faltering.
- The only tools needed are weighing scales and charts — usually easy to carry and relatively cheap.
- Weighing is a fairly easy and quick task for inexperienced health workers although it does require a health worker to be numerate.

Disadvantages

- Weighing should be done regularly and this is not always possible.
- It is necessary to know a child's age to the nearest month and this information is not always available. (It is harder to estimate accurately the unknown ages of children over two years old than those aged 0-2 years.)
- Mothers may object to their children being weighed by being suspended from hanging scales, in some cultures, and many children feel frightened and insecure.
- Malnourished children — aged over one year — who have oedema or ascites may not be classed as malnourished when in fact they are.

Weight-for-length/height

This is a useful indicator where a child's age is unknown, or cannot be accurately determined, or where it is not possible to weigh a child repeatedly over a period of time. The degree of wasting can be assessed by comparing the child's weight with the weight that would be expected for a healthy child of the same height. To obtain weight-for-height, a child is weighed, its height measured and the weight of the child being examined is divided by the weight of a reference child of the same height to obtain a percentage. A child who is less than 70 per cent of the expected weight-for-height is classed as severely wasted. (This cut-off-point is often used in emergency situations to screen children to find who might benefit from special feeding programmes.)

The Nabarro chart, which does not involve the use of tables or calculations, consists of a full-sized coloured chart which is mounted on a wall or a narrow chart mounted on a 12 cm wide plank. The child is weighed and stood up against the chart opposite the bar representing his weight. The position of the top of the child's head compared with the colour code of the bar indicates if the child is wasted. (For a very young child it is better that the height be measured lying down.)

Advantages of weight-for-height as a monitor of growth

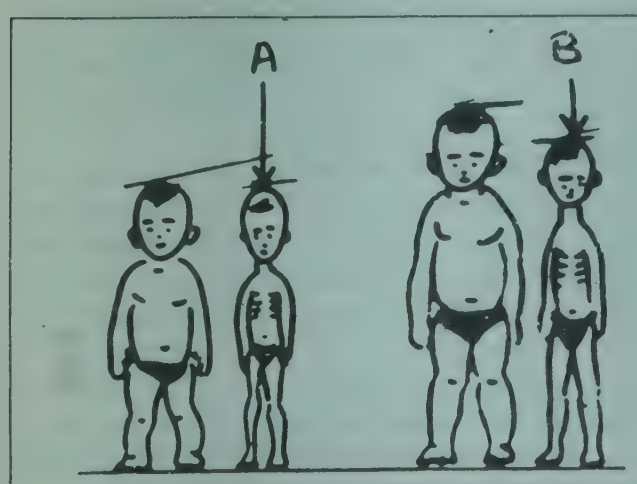
- It identifies the very thin or wasted child with definite malnutrition who requires immediate attention.
- It is a good indicator to distinguish children who are well-proportioned from those who are thin for their height. (Weight-for-age classifies many children as malnourished who are short but have normal body proportions.)
- It does not require age data.

Health Worker and Mother Measuring Child on Nabarro Thinness Chart.

Source: London School of Hygiene and Tropical Medicine, London, U.K.

Disadvantages

- Stunted children with reasonable body proportions are classified as not malnourished, but children who are short (stunted) and also thin, will be classified as wasted, rather than stunted.
- Two pieces of equipment are required, a height as well as weighing scale. This adds to expense and transportation problems.
- Taking two measures takes longer, and this is a problem for the busy health worker, more training is also required and there is more chance of error.
- Some mothers may be reluctant to have their children weighed.
- Measuring height or length requires two people.
- It is more difficult for unskilled workers to learn to take accurate measurements of length and height than to weigh a child.



Child A is thinner than a boy of the same age. Child A is **wasted.**

Some time later, the same child (B) is now shorter as well as thinner. Inadequate height for a particular age is described as stunting. This child is **stunted** as well as **wasted.**

Height-for-age

Height-for-age compares a child's height with the expected height for a healthy reference child of the same age. The measure can be used to assess stunting, which may be an index of long-term nutritional deprivation. A child who measures 85 per cent or less of the standard reference height-for-age is considered to be severely stunted.

Advantages of height-for-age as a monitor of growth

- It can indicate past nutritional problems and illnesses.
- A board for measuring length and height can be made locally at low cost and easily transported.
- Mothers are rarely unhappy about a child being measured with a measuring board.

Disadvantages

- Changes in height occur relatively slowly compared with weight changes.
- It is not recommended as an independent measure.
- It is more difficult for unskilled workers to learn to take accurate measurements of length and height than to weigh a child.
- Two people may be required to measure height/length and accurate age data are also required.

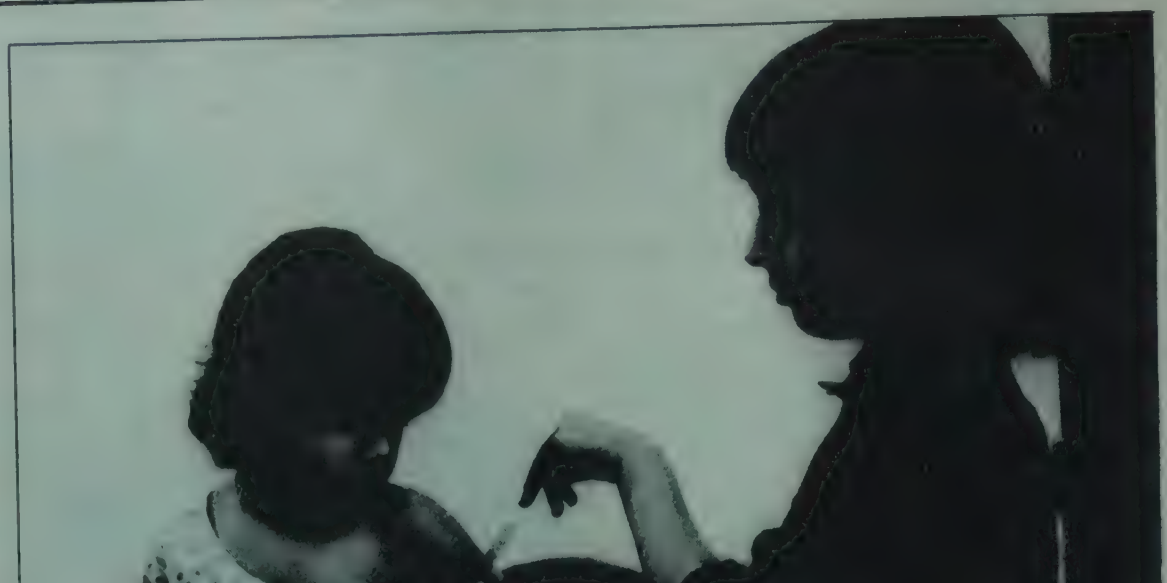


Photo by Z. Ebrahim. Institute of Child Health

Mid-upper arm circumference

The circumference of the mid-upper arm (MUAC) increases in size during the first year of a child's life quite significantly, but relatively little between the ages of one and five years. At birth an infant's upper arm circumference is about 10.5cms. By the age of one year it will have grown on average to about 16.5 cms. Over the next four years until the child is five years old, the circumference only grows about 1 cm to 17.5 cms at the most. Any child aged between one and five years whose arm circumference is less than 12.5 cms may be undernourished — and this cut-off point of 12.5 cms is most frequently used. Low MUAC is more closely associated with acute malnutrition (wasting) than stunting. MUAC is useful as a method of screening large numbers of children, during nutritional emergencies for example, but it is less useful in longer-term growth monitoring programmes.

Advantages of MUAC as a monitor of growth

- A useful indicator of severe current malnutrition, whether or not stunting is present.
- It is quick to use and the measuring tape can be colour-coded for use by non-literate health workers or the community.
- It does not require age data.
- There are no known objections by communities to this measure.
- Although MUAC does not indicate changes as rapidly as monitoring weight, it can be useful to indicate changes in nutritional status.
- The arm tape is inexpensive and easily portable, and can be easily made by health personnel.

Disadvantages

- It only identifies children with severe malnutrition, and it is not a sensitive early predictor of malnutrition.
- There is a great variability in measurements. Finding the mid-point of the upper arm and placing the tape around the arm without compressing the flesh is not easy.

HOW TO MEASURE

Important criteria for choosing measuring equipment include:

- standardisation — consistent results using an instrument for a known measure;
- ability to maintain accuracy — reliability;
- ease of (correct) use, readability, portability;
- low cost, durability, ease of repair;
- local availability of equipment and cultural acceptability of the method.

Weighing scales

In choosing scales the following criteria should be considered:

- The accuracy of the scale to the nearest 250 gms (preferably the nearest 100 gms or quarter of a pound, especially for young children).
- A total weight capacity of at least 25 kg, or 50 lbs, for programmes weighing children under six (although the majority of critical weighings will be in children under 15 kg).
- Ease of reading numbers, with no confusion between kg and pound gradients if they are both on the same scale. A direct transfer to growth charts and interpretation of the results should be possible without mathematical calculations.
- Does not lift the baby too high off the ground/floor.
- An adjusting mechanism which allows the scale to be tared (this means to adjust the needle to zero. If the needle rests on one side or other of zero the reading will be inaccurate. When something like a basket to hold the child is hung on the scale this weight needs to be subtracted before the child is weighed. If the scale can be tared it is not necessary to subtract from the indicated weight).
- The reading point of the scale should be at eye level so that it can be read more accurately.

Scales can be locally manufactured, but check accuracy by careful standardisation both during construction and during use. Primitive scales may also be more difficult to use. Advantages include:

- less expensive;
- health workers gain new understanding and skills, if they and the community make the scales;

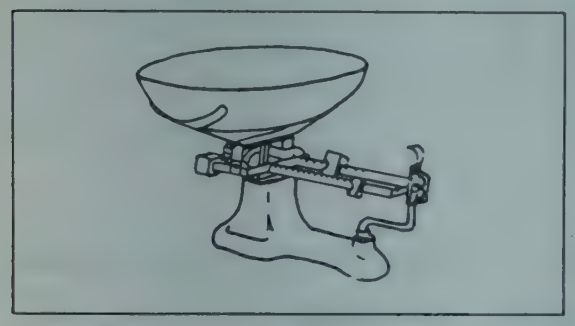
- encourages self-reliance.

* A design for a locally made weighing scale, currently being field-tested, is available from TALC. The scale requires a suitable spring and special weight charts, but, it is hoped, it will involve mothers more closely in monitoring their children's growth.

Commercially manufactured scales are available in a variety of forms.

Beam scales. Two types of single beam balance scales are used; both are easily maintained and remain accurate over time.

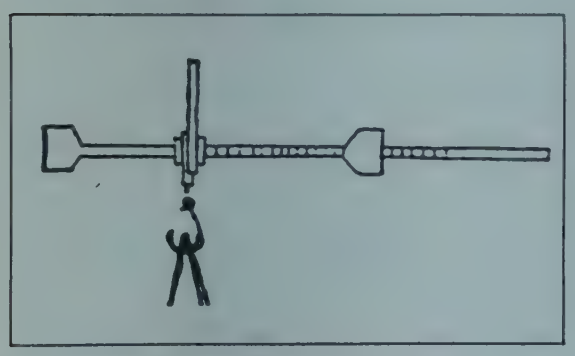
i) The model shown in the diagram is a floor or table type of scale in which the child can sit or lie, and problems of having to suspend the child to weigh it are eliminated. This variety has the disadvantages, however, of being hard to transport, and being more expensive than most types of scales.



Single Beam Scale for Clinic Use.

Source: CMS Weighing Equipment, Ltd., London, U.K.

ii) The second type of beam scale is called a bar scale and has a free hanging beam. If made from light materials this type of scale is easily transported. One general problem with beam scales is that of keeping the child still.

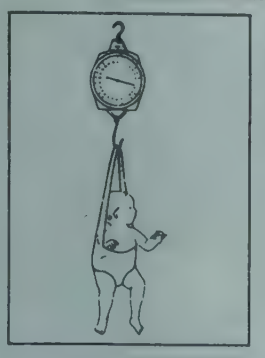


Indonesian Scale—Dacin.

Source: Nutrition Division, Ministry of Health, Jakarta, Indonesia.

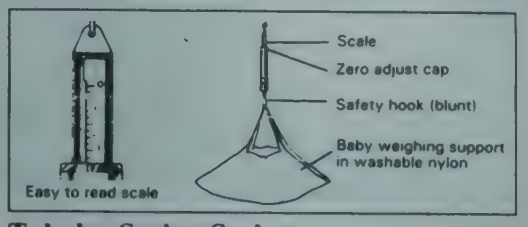
Spring hanging scales. These are usually spring scales which have either a dial-face or are tubular.

i) Dial-faced scales are light, easily transportable, durable, fairly accurate and easy to use. There have been problems with the internal parts of the scale rusting, and this type of scale is one of the most expensive of the dial models.



Dial-Shaped Spring Scale.

Source: Teaching Aids at Low Cost.



Tubular Spring Scale.

Source: Salter Abbey

ii) Tubular spring scales. These scales are light to transport, but are less durable and more difficult to read than the dial-faced variety. The problem of reading the scale is accentuated if the child is restless. The diagrams show a variety of methods of suspending a child to weigh it. Considerations include the ages of the children to be weighed and cultural acceptability.

In some places, for example, it may be better to use a net, hammock, box or basket, rather than suspend the child in weighing pants.

Bathroom-type scales. Although these are widely used, they are not accurate, and become unreliable but they are portable and cheap.

Digital scales. These electronic scales, a recent development, although quick and easy to use, are still relatively expensive. The scale displays the exact weight so that the health worker does not need to read the number from a continuous scale.

Equipment for measuring arm circumference

Measuring tapes should be made from durable, shrink-resistant material. Suggested materials for home-made tapes include strong card, plastic-coated cloth, and old X-ray film. Each measuring tape, whether commercially manufactured or produced locally should be checked regularly against a standard ruler. The beginning of the tape should be marked clearly on the arm measuring bands. There are several designs from simple strips to slotted versions with sliding scales for interpretation at different ages. If the "zero" is at the lead end of the tape, it avoids confusion but makes measuring more difficult. The band can be marked in cms or colour coded in risk zones.

Keeping records

The choice of record keeping system is important because the purpose of growth monitoring can be achieved only when repeated measurements can be compared at intervals. This is more useful than comparison with a reference population. The most useful type of record-keeping system is that which requires the least mathematical calculation by the health worker or mother and which shows whether the child is growing at an acceptable rate.

- An important purpose of growth monitoring is to help the health worker assess the health status of the individual child in order to decide on appropriate action, and to interest the family in the health of the child.
- Another purpose is as a reminder to health workers about different aspects of child care which should be reviewed.
- Another possible role for growth monitoring is to motivate and educate families. Frequently, the cards are only designed for the record-keepers and not for teaching mothers or other family members. Cards often provide no space to record the action recommended to help the child. This could be a reminder for parents and health workers and a focus for future discussion.

Considerations in chart design

- Size of the chart and the writing space. Size should be determined by the amount of information to be recorded. There should be enough space to see changes in weight and write in comments about diseases, advice given etc.
- Cultural context. The cultural beliefs and understanding of mothers should be incorporated into the design to make the educational task easier. Cards for use by parents should be in the local language with appropriate symbols.
- Ease of interpretation. Overcrowding with information and unnecessary lines only confuses. Use only cut-off lines which are absolutely necessary to determine the appropriate action for the child. Although different systems may be necessary because of varying programme objectives, one type of card should be used in a single clinic or village and preferably throughout the country.

Equipment for measuring height and length

Two types of equipment are needed, for measuring standing height, and length lying down. A well-designed measuring board can be used for both but may not be very portable. Boards can be purchased or made locally.

The *weight-for-height,* or *'thinness' chart,* (Nabarro chart), contains a height scale. It was described earlier, is easily transportable, light, measures approximately 140 cms × 100 cms but is only made of thick paper. It is nailed or taped to the wall so that the bottom of the chart is at ground level. Life size cut-outs are available for training purposes.

ICCDR, B Photo by Asem Ansari

Using a Baby Length Measuring Board.

Estimating a child's age

Where a child's age is unknown the table shows some methods that may be useful in estimating the child's approximate age. A local events calendar which includes harvest time, religious festivals, or natural disasters, is most valuable. Also useful, is comparing the child with other children in the village whose ages are known.

The child is like this:	So he is this old:
No teeth, can't sit alone	0-5 months
Has 1-6 teeth, can sit alone, can't walk alone	6-11 months
Has 6-18 teeth, can walk, knows a few words	12-23 months
Has 18-20 teeth, walks well, starting to talk well	24-35 months
Walks and runs well, talks well, has not yet lost first baby teeth	36-59 months

Be careful: You should never look at the size of a child when you are guessing his age. If the child is malnourished, his small size will make you think he is younger than he really is.

COUNTRY EXAMPLES

Indonesia

- In Indonesia 2.5 million infants and young children are being weighed regularly at the traditional monthly meetings of village women. The results are entered on growth charts kept by the mothers themselves.

Thailand

- In Thailand, a programme based on the home use of growth charts by parents in several villages, helped to eliminate completely third degree malnutrition and reduce second degree malnutrition by 44 per cent during 1981-1982, even though no additional food was provided.

Colombia

- In Colombia, improvements in weight gain for a majority of children suffering from mild, moderate and severe malnutrition have been achieved in poor communities by nutrition programmes incorporating the "Carnet de Salud" or health card kept at home by mothers.

Jamaica

- In Jamaica, a systematic programme to improve the health and growth of over 6,000 young children using growth charts, immunisation and nutrition education and milk supplements, has resulted in a 40 per cent decline in the prevalence of malnutrition and a 60 per cent fall in infant mortality.

Source: UNICEF State of the World's Children 1985.

Ghana

- In Ghana a survey was undertaken to find out how mothers measured growth. Many cultures have traditionally used a variety of indicators to measure their children's growth and development. These should be taken into consideration and used by the community health worker to understand the community's perceptions, so that they can be related to the use of growth charts and mothers' participation be encouraged in improving child care. Ghanaian mothers interviewed for the survey, believed that their children were growing well when they: had a good appetite; were fat rather than thin; were learning new things at the right time; seemed heavier when lifted; had normal bodily functions and healthy skin and general appearance; good humour and were happy and active; and were growing taller. Bead strings tied around the waist, legs or wrists of children were used as indicators to measure growth. By the time a child is five months old, the bead strings around the waist should have been changed or adjusted five times. Reasons given for poor growth included: lack of food; insufficient breastmilk; a new pregnancy forcing the mother to wean too early; bad feeding practices; not taking enough time to prepare food; and the death of a parent. Growth and failure to grow were therefore associated with more than just an increase or decrease in weight.

Source: Mothers and Children, Volume 5, Number 1. November-December 1985. American Public Health Association.

HEALTH BASICS:
IMMUNISATION

Six preventable childhood diseases for which vaccines are widely available are measles, pertussis (whooping cough), tetanus, polio, diphtheria and tuberculosis. Of these, measles is the most clearly related to diarrhoea. Diarrhoea often follows an episode of measles, and the combination of the two illnesses can be fatal. It is estimated that up to 26 per cent of diarrhoea-associated mortality could be prevented by measles vaccination[1]. Pneumonia, malnutrition and shigella dysentery are complications associated with measles. Preventing measles could also reduce the incidence of malnutrition and vitamin A deficiency, both of which are associated with serious attacks of diarrhoea.

[1] R.G. Feachem and M.A. Koblinsky: Interventions for the control of diarrhoeal diseases among young children: measles immunisation. Bulletin WHO 61, 641-652, 1983.

What is immunisation?

Immunisation is the giving of a vaccine or vaccines to stimulate the body to create immunity against specific diseases. Immunity is the body's ability to protect itself against the bacteria and viruses which cause disease.

Why immunise?

Every year in developing countries 110 million episodes of illness occur which could be prevented by immunisation. As a result 3·5 million children die. Children with these illnesses are also more likely to develop other infections, such as diarrhoea, as their resistance and ability to fight off infection is reduced. Widespread use of vaccines in the developed world is a major factor in the reduced mortality and morbidity from these six diseases and associated illnesses. Immunisation is a more effective way of using scarce resources than treating diseases after they occur.

The six major childhood immunisations

Measles

- Measles vaccine is made from live measles virus which has been weakened (or attenuated) and is given subcutaneously in one dose. The infection provides long lasting protection against measles. Those vaccinated may feel unwell with a mild fever, and/or rash five to ten days after vaccination.

Diphtheria, pertussis, tetanus

- DPT vaccine combines diphtheria, pertussis (whooping cough), and tetanus immunisations in one injection. The injection is given intramuscularly in three doses four weeks or more apart and protects for at least ten years against the three diseases. Common side effects to the injection include fever and redness and swelling at the injection site.

Polio

- The oral polio vaccine contains the weakened viruses of the three types that cause polio. It usually provides permanent protection against this crippling disease, and is given in three doses 4 weeks or more apart (usually at the same time as DPT). In countries where polio remains endemic, if possible, a child should receive an additional polio vaccination at birth.

BCG

- BCG vaccine is given intradermally (within the skin layer, raising a blister) and guards against tuberculosis (TB). Studies concerning efficacy of the BCG vaccine have produced conflicting reports. Most people agree that it gives good protection against the lethal forms of childhood TB. An ulcer forms at the injection site and heals without treatment, forming a scar.

PAHO photo

Immunisation can reduce mortality and morbidity from common childhood diseases.

IMMUNISATION

The Expanded Programme on Immunisation (EPI)

The eradication of smallpox by vaccination is one of the greatest achievements of the World Health Organization (WHO). Recognising the serious problem of infectious childhood diseases, and the benefits of immunisation, WHO set up the Expanded Programme on Immunisation (EPI) with the goal of making immunisation services available to all the world's children by 1990. UNICEF also provides vaccines, supplies and equipment, and supports national programmes through social mobilisation efforts. EPI helps national immunisation programmes by providing training, vaccines, equipment, and technical backup. It also supports programme evaluation and field testing of improved equipment and methods.

WHO's EPI has estimated that coverage rates for the vaccines in children under one year old in developing countries (excluding China) are as follows:

Immunisation	June 1987
DPT (third dose)	45 per cent
polio (third dose)	44 per cent
measles	30 per cent
BCG	45 per cent
tetanus toxoid (for women)	21 per cent

Source: WHO/EPI

When EPI began in 1974 these figures were only about five per cent. It is now hoped that the majority of children will be fully immunised within the next few years.

UNICEF photo

Successful immunisation programmes depend on commitment at all levels.

What factors contribute to successful national immunisation programmes?

- *Community* — mothers and families must want immunisations for their children, and know when and where to get them;
- *Personnel* — well-trained staff: health workers who are committed to immunisation and who know how to give vaccines safely and when to give them;
- *Vaccines* — their safety, effectiveness and stability; the 'cold chain' — transportation, storage and handling of vaccines to ensure that they are kept at the right temperature and in the right conditions until they are used;
- *Equipment* — for vaccination and sterilization of syringes and needles;
- *Programme management* — including schedules, records, training, monitoring and evaluation and management of money, personnel and supplies;
- *Good supply networks* — to ensure vaccines are delivered when and where needed;
- *Political commitment* — at all levels, to immunisation programmes.

Who should be immunised and at what age?

Infants and children

All children should be immunised against the preventable childhood diseases. The immunisation schedule describes the number of times that a child needs to be given vaccinations and how far apart each visit should be. Following the *ideal* schedule, each child should be fully immunised by the age of nine months, or soon after, because infants are at greater risk from these diseases. Many countries try to immunise all children under five years of age who may be at risk.

Women

Neonatal tetanus is prevented for several years by immunising women of child-bearing age with at least two doses of tetanus toxoid. After five doses of tetanus toxoid *all* children born subsequently are protected from neonatal tetanus. A woman who received three doses of DPT as a child will greatly increase her infants' protection by two boosters (ideally before or during early pregnancy) when she is ready to bear children. (Hygienic cord treatment can also prevent neonatal tetanus but is not as effective as complete immunisation of the mother.)

IMMUNISATION

- **A schedule recommended by WHO to assure protection at an early age is as follows:**

Age	Vaccine	Reason
Birth	BCG*, OPV*	• BCG given at the earliest possible age protects against the possibility of infection from other family members. The extent of protection against polio is increased the earlier the OPV is given.
6 weeks	DPT(1)*, OPV(1)	• An early start with DPT reduces the chances of severe pertussis.
10 weeks	DPT(2), OPV(2)	• Four week intervals between doses give effective protection, and reduce the time a child is exposed without protection, particularly to pertussis.
14 weeks	DPT(3), OPV(3)	
9 months	Measles	• At least 80 per cent of measles in children in the third world can be prevented by immunisation at this age.

*N.B. *BCG: Bacillus Calmette Guerin (against TB)*
**OPV: Oral Poliovirus Vaccine (dose at birth is in addition to the standard schedule of 3 doses)*
**DPT: Diphtheria/Pertussis/Tetanus Toxoid*

Missed immunisation dates

If it is not possible to bring a child for immunisation on the right day, the immunisation must be given as soon as possible afterwards. Once begun, a series of immunisations must be completed to be effective. Even if the time between immunisations is longer than recommended, the *next* dose in the polio and DPT series is given; there is no need to start from the beginning again. Only a completed series of immunisations adequately protects a child. In remote areas, and places where for other reasons it is not possible to do this, schedules such as the one below, and mass immunisation days have been used.

- **Simplified schedule for remote populations (two contacts as used in parts of West Africa)**

Age	Vaccine	Reason
All children 3-8 months old	DPT(1)-IPV(1), BCG	• IPV in two doses is protective against paralytic polio.
All children 9-14 months old	DPT(2)-IPV(2), measles	• In remote areas the average age of contracting measles is delayed to the second and third years of life and later vaccination is still effective.

N.B. IPV: Inactived Poliovirus Vaccine
DPT-IPV may be obtained in a single preparation
EPI also recommends that OPV be added to this schedule.

- **Semi-annual single day 'pulse' campaigns (as used in Brazil)**

Age	Vaccine	Reason
All children 0-59 months old	OPV (up to 10 doses)	• After regular vaccination with OPV vaccine, the vaccine virus replaces the naturally occurring disease-causing virus in the environment.
All children 9-23 months old	measles (up to 2 doses)	• Giving a second dose of measles vaccine increases effective coverage.
All children 2-11 months old	DPT (2 doses)	• Third DPT through regular primary health care services in clinics; 2 doses of DPT are partially effective (50-60%) against pertussis.

Organisation

Vaccine schedules have to suit the circumstances in particular countries. Ideally, most developing countries should follow the WHO recommended schedule of five contacts but this requires an effective health infrastructure to which all people have access. Mass campaigns, with immunisation days, can successfully increase awareness about immunisation and vaccinate large numbers of children. However, only when health systems are developed to ensure regular vaccination of all newly born children every year, will full coverage be achieved.

Reaction to immunisation

After immunisation some children develop mild reactions, such as fever, or a swollen area around the injection site. This is quite normal with some vaccines and may be part of the body's response to developing protection. Parents should be told that this is likely to happen so that they do not worry about it and it does not prevent them:

- from bringing the child back for further immunisation doses; or
- from bringing their other children to the clinic for immunisation.

Can a sick child be immunised?

Mothers sometimes do not bring a sick child for immunisation and if they do, health workers frequently do not immunise them. Mothers and health workers need to know that **all EPI immunisations are safe and effective even if a child is ill** with fever, diarrhoea, vomiting, or respiratory infection. No chance should be missed to immunise a child. This is a recommendation of the EPI.

The benefits of immunisation far outweigh the risks, especially in malnourished children. Only in very few exceptional cases is it not advisable to immunise. For example, a child who has had a severe reaction to DPT (fits, extreme crying) should not be given pertussis immunisation, but should get diphtheria-tetanus vaccine.

IMMUNISATION

WHO photo by H Page

Oral administration of polio virus vaccine in Columbia.

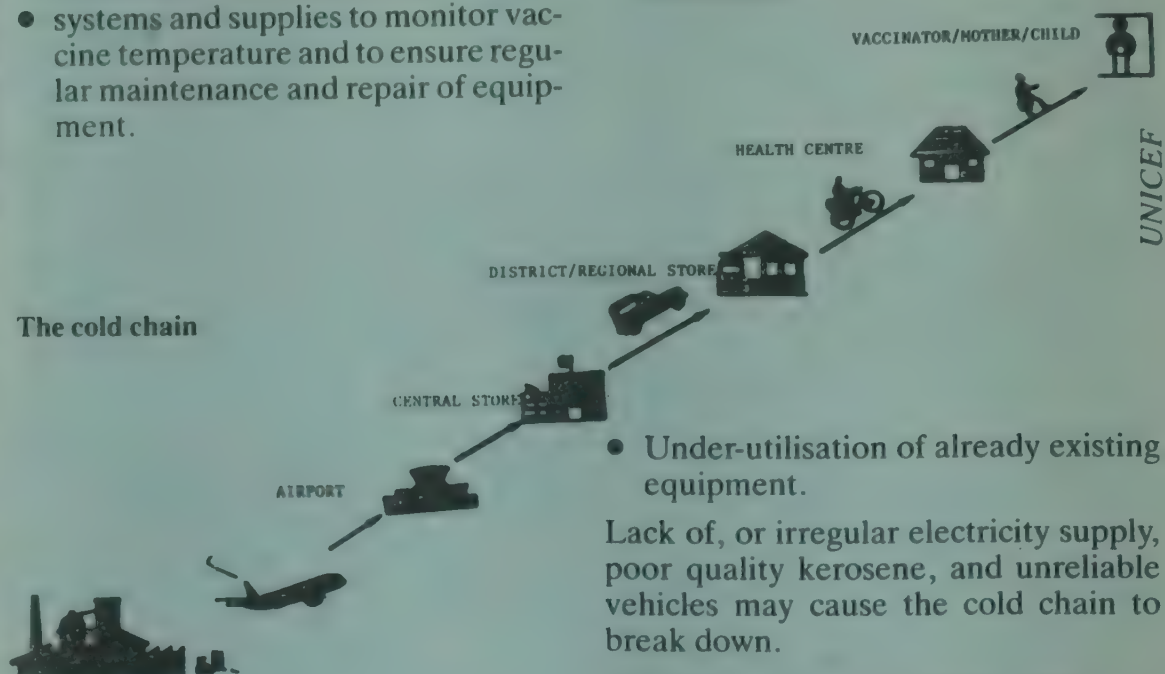
Immunising safely

It is important that health workers know how to give *all* injections safely, to avoid causing abcesses or transmitting infections — such as hepatitis B and HIV (the AIDS virus). Each child should be vaccinated with a sterile syringe and a sterile needle. In most places this means that reusable needles and syringes must be sterilised carefully after each injection is given, by boiling them in clean water in a covered pot or in a steam steriliser. Where disposable needles and syringes are used, they must be destroyed after a single use. **Remember:** one child, one needle, one syringe.

What is the cold chain?

The cold chain is the means by which vaccines are continuously maintained at safe temperatures from the time of manufacture until they are used by the health worker. It includes every stage of transportation and storage at international, national and district level — from central cold stores to health centres and clinics down to mobile immunisation teams in remote rural areas. If the cold chain breaks down at any stage and vaccines are exposed to heat (or freeze when they are not supposed to) they will not give effective protection. Six things are needed for a successful cold chain:

- well trained personnel with clear responsibilities;
- reliable vehicles for transporting vaccines;
- proper refrigeration and icemaking equipment;
- cold boxes and vaccine carriers used at the place where children are immunised;
- centrally organised supply systems to ensure that proper quantities of vaccines are supplied regularly where and when they are needed;
- systems and supplies to monitor vaccine temperature and to ensure regular maintenance and repair of equipment.



The cold chain

Vaccine storage

Each vaccine needs to be kept at the correct temperature to keep it safe, effective and stable. Live polio and measles vaccines are most sensitive to heat, tetanus toxoid least sensitive.

What are the problems associated with immunisation programmes?

Vaccines and equipment

- Breakdown of vehicles and equipment — lack of spare parts, repair and maintenance skills, shortage of fuel.
- Under or over-supply of vaccines and other supplies such as needles and syringes at different levels of the cold chain.
- Under-utilisation of already existing equipment.

Lack of, or irregular electricity supply, poor quality kerosene, and unreliable vehicles may cause the cold chain to break down.

- If the cold chain breaks down and vaccines are exposed to heat they will not be effective. Health workers must be confident that they are giving potent vaccines to children. Vaccines are destroyed by either a lot of heat at once (for example in a closed vehicle) or a small amount of heat on many occasions (for example constantly opening and closing of a refrigerator door). Once a vaccine is spoiled it cannot be restored by cooling it.

Recommended storage temperatures and times are shown below:

Level:	**Central store**	**Regional**	**Health Centre**	**Transport**
Maximum time:	*Up to 8 months*	*Up to 3 months*	*Up to 1 month*	*Up to 1 week*
Measles	−15°C to −25°C		less than +8°C	
Oral polio virus	−15°C to −25°C		less than +8°C	
DPT		+2°C to +8°C		
Tetanus toxoid		+2°C to +8°C		
BCG		less than 8°C		

NB: DPT and tetanus toxoid must never be frozen.

IMMUNISATION

- It is not possible to tell whether or not a vaccine has been heat spoiled by looking at it. Instead the temperature must be checked daily at every stage of the cold chain. Cold chain monitors — chemical monitors — which change colour if the temperature goes above a safe limit for a period of time can help to keep a check on this.
- It is important that effective refrigerators, cold boxes, and insulated vaccine carriers are used. This equipment needs to be carefully maintained to ensure that it works efficiently and maintains the correct temperatures for vaccine effectiveness.

Vaccine development

Current research in diarrhoeal disease vaccines is focusing on developing or improving vaccines against specific organisms which cause diarrhoea such as rotavirus, *enterotoxigenic E coli,* cholera, typhoid and shigella.

Management problems

- Lack of supervision, shortages of trained personnel, or low morale of health workers due to poor pay, poor training, too much to do, intermittent supplies;
- Difficulties in following up mothers and children in families who may migrate to cities or other villages;
- Limited communications create problems for information flow between health workers and supervisors;
- Poor record-keeping, reporting of activities and surveillance.

Community problems

Communities must be involved in the decision to implement immunisation programmes. Families must want to have their children immunised and know why immunisation is important. It is equally important that they know that children may suffer mild side effects from the vaccinations. Specific problems may include:

- Lack of awareness about vaccination;
- Lack of access of health facilities;
- Fear of side effects;
- Lack of understanding about the purpose of immunisation;
- Traditional views about what is necessary to protect children;
- Seasonal effects which reduce opportunities for immunisation, e.g. rainy season, harvesting or planting.

In a survey carried out in a Latin American country of 1,145 children, children had not been taken for immunisation or had not completed a series of immunisations because:

- Family had fear of, incorrect ideas about immunisation: 32 per cent;
- Child was ill that day: 29 per cent;
- System failure (access, communication, availability): 18 per cent;
- Family unaware of EPI: 13 per cent;
- Child already had the disease: 6 per cent.

Health workers need to be able to:

- Inform parents where, when and how often their children should be immunised;
- Remind parents to take their children back for follow-up doses;
- Encourage women of child-bearing age to be immunised against tetanus;
- Explain to people about reactions to immunisation and ease their fears.

How can diarrhoeal disease control and immunisation activities be combined?

- *Using every opportunity*

If a child is brought to a clinic with dehydrating diarrhoea and is given ORT, this provides an opportunity for health workers to ask mothers about immunisation, and to immunise the child as needed. This applies if a child is brought to a clinic for any reason. It is particularly important to immunise a child with malnutrition. Many children actually catch measles in a clinic or hospital; this could be prevented by immunisation at the time of exposure. It is important, also, that visits to clinics or health centres are used as opportunities to talk about and to give immunisations. Health cards which combine growth charts and records of immunisation and illnesses are desirable.

- *Research*

Unanswered questions about immunisations and child health — How do mothers protect their children from illness? When do they bring their children for vaccinations or use ORT? Do they know how to give ORT? Do they know about immunisation schedules? What is the best way to pass on this knowledge? What alternative vaccines or schedules will best protect a child living in remote areas, in difficult environments? These questions can and should be answered through research; diarrhoeal diseases research can provide valuable data for EPI and *vice versa*.

- *Promotion and education*

For both ORT and immunisations, health education messages must be consistent with people's ideas and beliefs. People must be able to afford the money, time and effort involved. Also the products must be available when they need them.

WHO photo by J Littlewood

Visits to health centres and clinics should be used as opportunities for immunisation.

- *Management*

Planning, supply and logistics, administration, finance and budget, training, supervision, monitoring and evaluation are all important programme components. It is less wasteful of scarce resources and staff if EPI and CDD can share or pool their strength in these areas.

IMMUNISATION: RESOURCE LIST

SOURCES OF INFORMATION AND EQUIPMENT

- **Agency for International Development (AID),** Office of Health, Bureau of Science and Technology, Agency for International Development, Washington, DC 20523, U.S.A. CONTACT: Dr Kenneth Bart
- **American Public Health Association (APHA),** 1015 15th Street, NW, Washington, DC 20005, U.S.A. CONTACT: Dr Susi Kessler
- **Appropriate Health Resources and Technologies Action Group (ARHTAG),** 85 Marylebone High Street, London W1M 3DE, U.K. CONTACT: Ms Suzanne Fustukian
- **Centers for Disease Control,** Public Health Service, Department of Health and Human Services, Atlanta, GA 30333, U.S.A. CONTACTS: Dr Alan Hinman, Dr Stanley Foster
- **Equipment to Charity Hospitals Overseas (ECHO),** Ullswater Crescent, Coulsdon, Surrey CR3 2HR, U.K. CONTACT: Dr John Townsend
- **Evaluation and Planning Centre for Health Care (EPC).** LSHTM, Keppel Street, London WC1E 7HT, U.K. CONTACT: Dr Patrick Vaughan
- **International Children's Centre.** Château de Longchamp, Bois de Boulogne, F-75016, Paris, France. CONTACT: Dr N. Guerin
- **Institute of Child Health.** Tropical Child Health Unit, 30 Guilford Street, London WC1, U.K. CONTACT: Professor David Morley
- **League of Red Cross and Red Crescent Societies,** C.P. 372, 1211 Geneva 19, Switzerland. CONTACT: Marianne Enge
- **Pan American Health Organization,** Expanded Programme on Immunisation, 525 23rd Street, NW, Washington, DC 20037, U.S.A. CONTACT: Dr Ciro de Quadros
- **POLIOPLUS PROGRAM, Rotary International,** 1600 Ridge Avenue, Evanston, Illinois 60201, U.S.A. CONTACT: Mr Michael McQuestion
- **Program for Appropriate Technology in Health (PATH),** Canal Place, 4 Nickerson Street, Seattle, WA 98109, U.S.A. CONTACT: Ms Vivien Tsu
- **Resources for Child Health (REACH)** Project, John Snow, Inc., 1100 Wilson Blvd., 9th Floor, Arlington, VA 22209, U.S.A. CONTACT: Dr Pierre Claquin, Dr Norbert Hirschhorn
- **Save the Children Fund,** 17 Grove Lane, London SE5 8RD, U.K. CONTACT: Dr Peter Poore
- **Teaching Aids at Low Cost (TALC),** P.O. Box 49, St Albans, Herts. AL1 4AX, U.K. CONTACT: Mrs Barbara Harvey
- **UNICEF,** 866 United Nations Plaza, New York, NY 10017, U.S.A. CONTACT: Dr Terence Hill
- **UNIPAC, UNICEF Procurement and Assembly Centre,** UNICEF Plaus, Freepost — DK2100, Copenhagen, Denmark. CONTACT: Mr Fred Irmer
- **World Health Organization (WHO),** Expanded Programme on Immunization, 1211 Geneva 27, Switzerland. CONTACT: Dr R. H. Henderson

BOOKS/MANUALS

AHRTAG, Battersby A. **How to choose and make a cold box,** 1984.

AHRTAG, Elford J. **How to look after a refrigerator,** 1980. 1983 (revised edition).

Child Alive. **Learn more about immunisation.** League of Red Cross and Red Crescent Societies, 1986.

Dick B. **Issues in immunisation in developing countries: an overview.** EPC 1985.

Expanded Programme on Immunization. **The Cold Chain Product Information Sheets.** WHO/UNICEF, 1987.

Favin, M., Sabin, E., and Stinson, W. **Immunizations.** World Federation of Public Health Associations, Geneva, May 1984.

Heggenbougen K. and Clement J. **Acceptability of childhood immunization: social science perspectives.** EPC, 1987.

Johns Hopkins University, Population Information Program. **Immunizing the World's Children.** Population Reports, Series L, Number 5, March-April 1986, Issues in World Health.

King M. et al. **Primary Child Care.** Vols I and II, TALC, 1978.

Liberia, Ministry of Health and Social Welfare. **EPI Handbook for Healthworkers.** 1982. EPI, P.O. Box 3600, Monrovia, Liberia.

POLIOPLUS PROGRAM. **The Challenge. An Action Guide for National POLIOPLUS Projects.** 1987. Rotary International.

Rockefeller Foundation. **Protecting the World's Children: Vaccines and Immunization.** (Presented at the Bellagio Conference, March 13-15, 1984.) New York, 1984.

The Task Force for Child Survival. **Protecting the World's Children: Bellagio II.** (Presented at the Cartagena Conference, October 14-16, 1985) Decatur, GA, 1986.

UNICEF. **The State of the World's Children, 1986.** Oxford University Press, 1986.

UNICEF. **Universal Child Immunization by 1990.** Assignment Children 69/72, 1985.

WHO. **Immunization in Practice: A Guide for Health Workers Who Give Vaccines.** WHO Training Course.

WHO. **Logistics and Cold Chain for Primary Health Care.** WHO Training Course.

WHO. **Technician's Handbook for Compression Refrigerators.** WHO Training Course.

WHO. **Training Course for Mid-Level Managers.** WHO Training Course.

WHO. **Training Course on Planning and Management.** WHO Training Course.

ARTICLES

Haaga, J. **Cost-effectiveness and Cost-benefit Analysis of Immunization Programmes in Developing Countries** in Jelliffe, D. and Jelliffe, E, eds., Advances in International Maternal and Child Health, v. 6, Oxford University Press, New York, 1986.

Feachem R.G. and Koblinsky, M.A. **Interventions for the Control of Diarrhoeal Diseases Among Young Children: Measles Immunization.** Bulletin of the World Health Organization 61(4), 1983, p. 641-652.

Foster, S.O., **Immunizable and Respiratory Diseases and Child Mortality** Population and Development Review, Fall Supplement 1984.

AUDIOVISUALS

Cold Chain — Target Diseases. (24 slides) TALC.
Cold Chain. (24 slides) TALC.
Primary Child Care. (240 slides) TALC.
Severe Measles. (24 slides) TALC.

NEWSLETTERS

ARI News. AHRTAG.
Child Alive Newsletter. League of Red Cross and Red Crescent Societies.
EPI Cold Chain Update. WHO.
EPI Newsletter. Expanded Programme on Immunisation, PAHO, 525 23rd Street, NW, Washington, DC 20037, U.S.A.
Feedback. International Health Program Office, Centers for Disease Control, Public Health Service, Department of Health and Human Services, Atlanta, GA, 30333, U.S.A.
Future. UNICEF Regional Office for South East Asia, UNICEF House, 73 Lodi Estate, New Delhi 110003, India.
Immunisations. International Children's Centre, Paris.
Weekly Epidemiological Bulletin. WHO.
World Immunization News (WIN). The Task Force for Child Survival, 1989 North Williamsburg Drive, Suite 1, Decatur, GA 30033, U.S.A.

Acknowledgement

This information has been prepared by REACH (Resources for Child Health), Ninth Floor, 1100 Wilson Boulevard, Arlington, VA 22209, U.S.A. *DD* would particularly like to thank Pierre Claquin, Norbert Hirschhorn, Cynthia Rawn, Paul Steele, and Robert Steinglass.

REACH is a project of John Snow incorporated, a contractor to the United States Agency for International Development (AID), providing short- and long-term technical assistance in immunization and health care financing, and primary health care systems support to countries assisted by AID.

HEALTH BASICS:
WATER AND SANITATION

Health workers are aware of the link between safe water supplies and excreta disposal and the prevention of diarrhoeal diseases, but the installation of these facilities only provides half the answer. Of equal importance is teaching people how to use them. When is handwashing most important? How do you maintain safe water supplies? This insert provides practical information on hygiene behaviour at family and community level before, during and after the installation of water and sanitation facilities.

SAFE WATER

To be sure that the water we use for drinking is safe, contamination must be prevented:

1. At the water source and in the water delivery system (wells, pipes, taps etc).

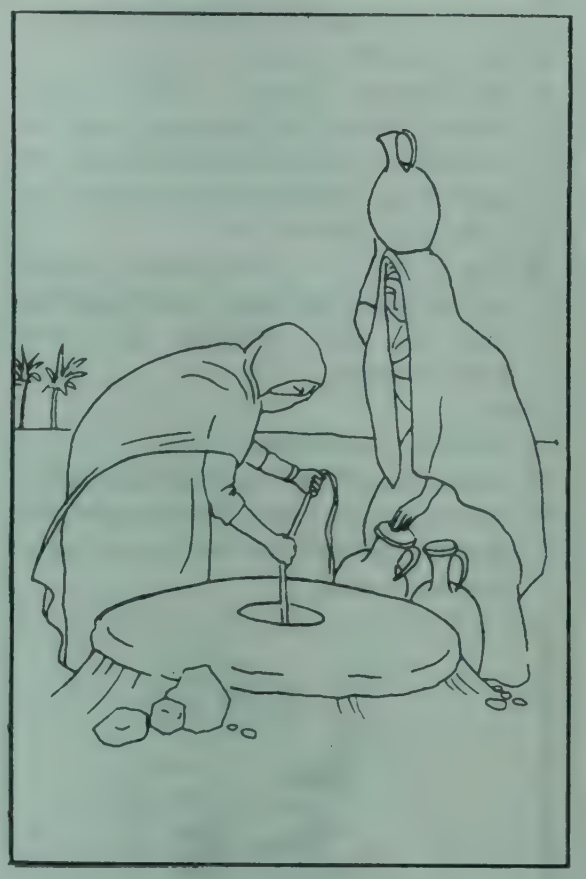
2. Between collection and use.

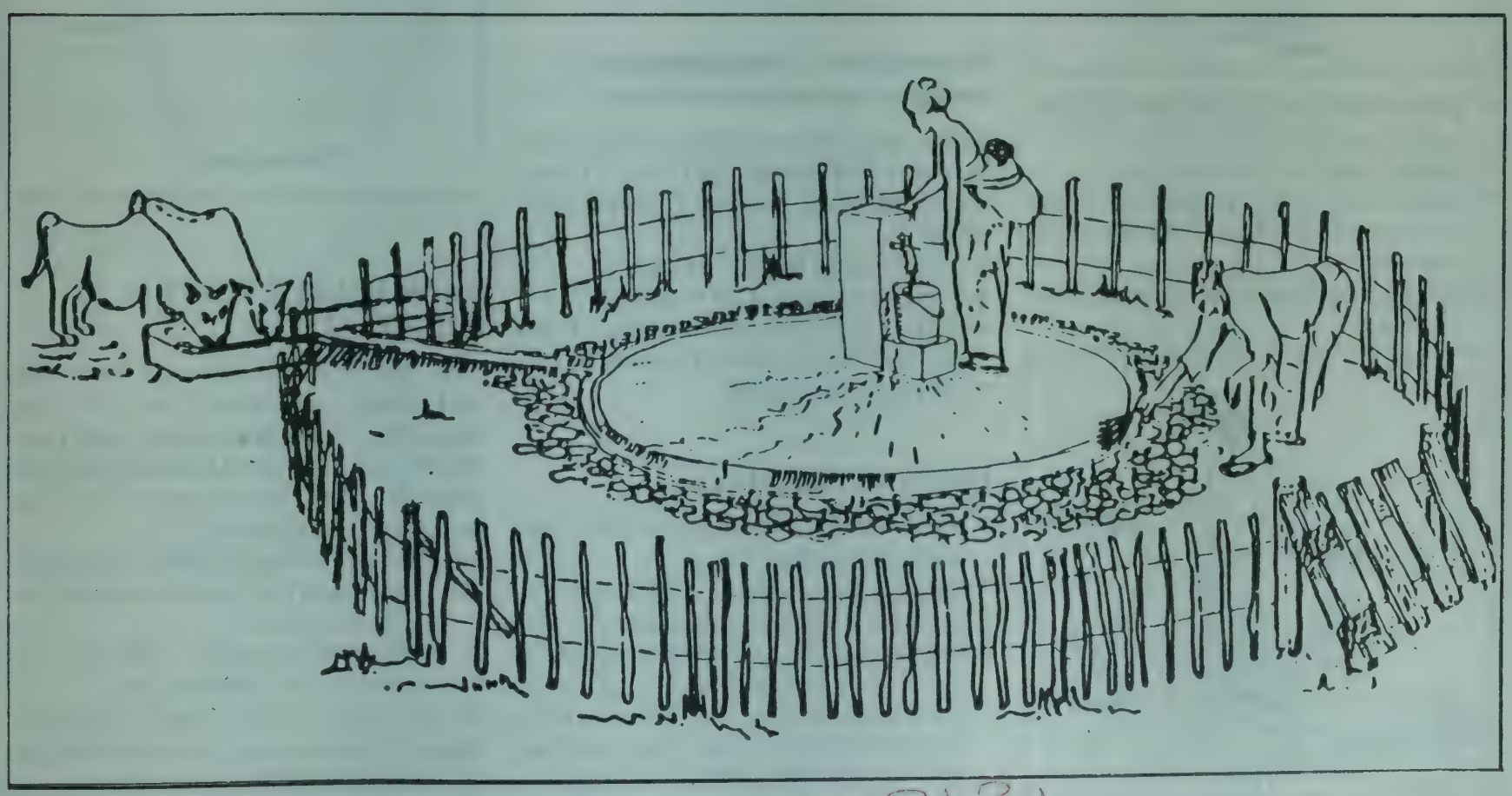
Safe water from wells

To protect well water from contamination you can:

- construct a wall around the well with a platform and drainage facilities. This will help to prevent soil from falling into the well and waste water from draining back into it;
- only use one bucket to draw water from the well and keep this bucket clean;
- if possible, keep the well covered when it is not being used;
- take care that the rope of the bucket cannot get dirty with soil and contaminate the water;
- make sure that your hands are clean when using the bucket;
- bathe, and wash clothes, away from the well so that waste water cannot drain back into the well;
- keep surroundings clean and animals away from the well.

These points are also equally important for wells where handpumps are used to lift the water instead of buckets. Handpumps need to be properly operated and maintained to guarantee a permanent supply of safe water.





Build a fence around the well or tap to keep out animals.

03131
CH100

WATER AND SANITATION

Safe water from public taps

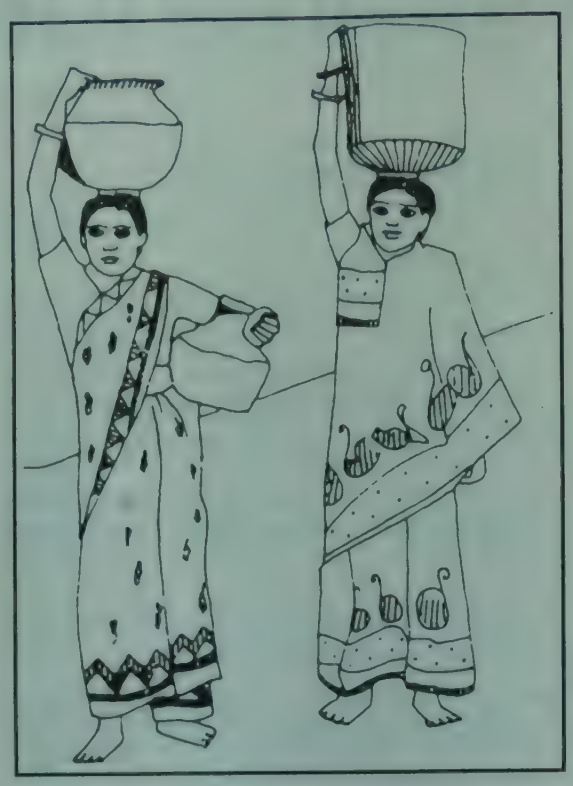
Tap water can be from a spring water, groundwater or surface water source. To ensure that this water is safe to drink, make sure that:

- the intake (water source) area, piping system and storage tanks are protected from contamination by human and animal, agricultural and industrial wastes; *or*
- the water is adequately treated before use (although treatment may not be very feasible in some communities).

Also:

- keep the taps clean;
- clean the area around the tap daily;
- clean (and unblock if necessary) the drains regularly so that waste water can drain away;

- prevent the area around the tap from getting muddy;
- repair cracks in the concrete;
- bathe and wash clothes at some distance away from the drinking water tap;
- keep cattle and other animals away from taps.



Other ways to stop water from being contaminated include:

- asking a person living near the tap to look after it;
- building special facilities at some distance away from the water source for bathing and washing clothes;
- making a fence around the tap to keep out animals;
- building special ditches or troughs away from the tap for cattle and domestic animals to drink from.

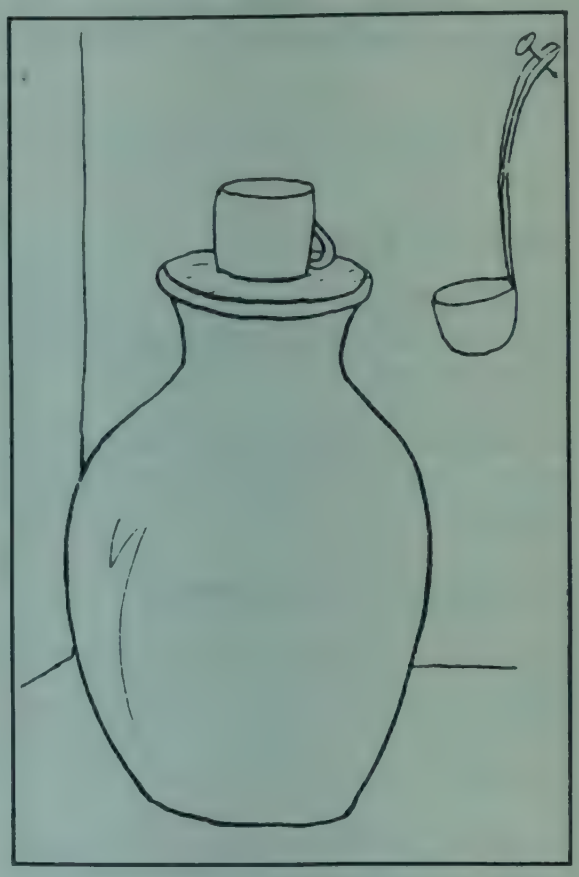
Prevention of contamination between collection and use

Water may become unsafe at any point between collection and use. Clean water can easily become contaminated when:

- it is touched by dirty fingers;
- it is poured into a dirty container;
- dirt or dust gets into the water from the air if the container is uncovered;
- dirty cups are used.

Points to remember:

- wash hands before collecting and carrying water;
- make sure the container for collecting the water is clean;
- carry water in a covered container if it has a large opening (e.g. if it is a bucket or basin). This will also help to prevent the water from spilling during the trip home (although a loose lid will not prevent spilling) and make sure the cover is clean;
- if possible, empty and clean the household water storage container daily;
- keep household water storage containers covered, and do not allow children or animals to drink from them;
- allow no one, especially a child, to put their hands into the storage container;
- pour water out of the water storage container without touching it, or use a clean long-handled dipper to take the water out;
- use clean cups or mugs for drawing and drinking the water.



SAFE WASTE WATER DISPOSAL

Safe waste water disposal from taps and after domestic use is very important. Stagnant pools of water and muddy places around houses and water collection sites are a health risk and can attract mosquitoes.

- clean and unblock drains near public taps regularly so that waste water can always run away;
- throw away domestic water waste or dispose of it in a soakage pit.

In dry areas where water is scarce, domestic waste water could be used to:

- water vegetables and fruit trees;
- water domestic animals;
- clean latrines.

WATER AND SANITATION

Latrines

A latrine is a safe place to pass stools and urine, but only when:

- it is properly built;
- well maintained;
- cleaned every day; and
- there are no flies.

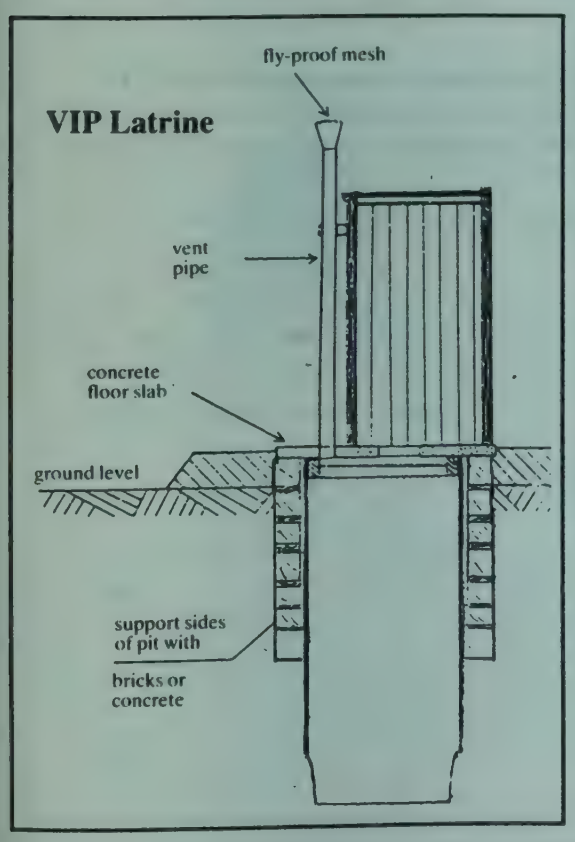
A good latrine should fulfil the following conditions:

- it should not contaminate the surrounding area;
- there should be no contamination of surface or ground water which can enter springs or wells;
- there should be no need to handle fresh faeces;
- faeces should not be accessible to flies, animals or other people;
- there should be minimal bad smells;
- the methods used to build latrines and maintain them should be simple and inexpensive;
- it should be safe and attractive for children to use;
- it should be designed in such a way that it is culturally acceptable.

Types of latrines

Pit latrine

The pit latrine consists of a hole in the ground bridged by a floor slab or squatting plate, around which a hut is build to provide privacy. A cover, with a long handle, can be used to prevent flies from entering the hole.



The pit latrine should be about 3 metres deep by 1 metre wide and the sides should be strengthened with sticks, stones, or bricks to prevent collapse.

When the pit is two-thirds full, it should be filled in with earth, and a new pit dug nearby. The liquids from the old pit will soak into the soil, and the solids remaining will become harmless after two years and can be dug from the pit and used as fertilizer.

VIP latrines

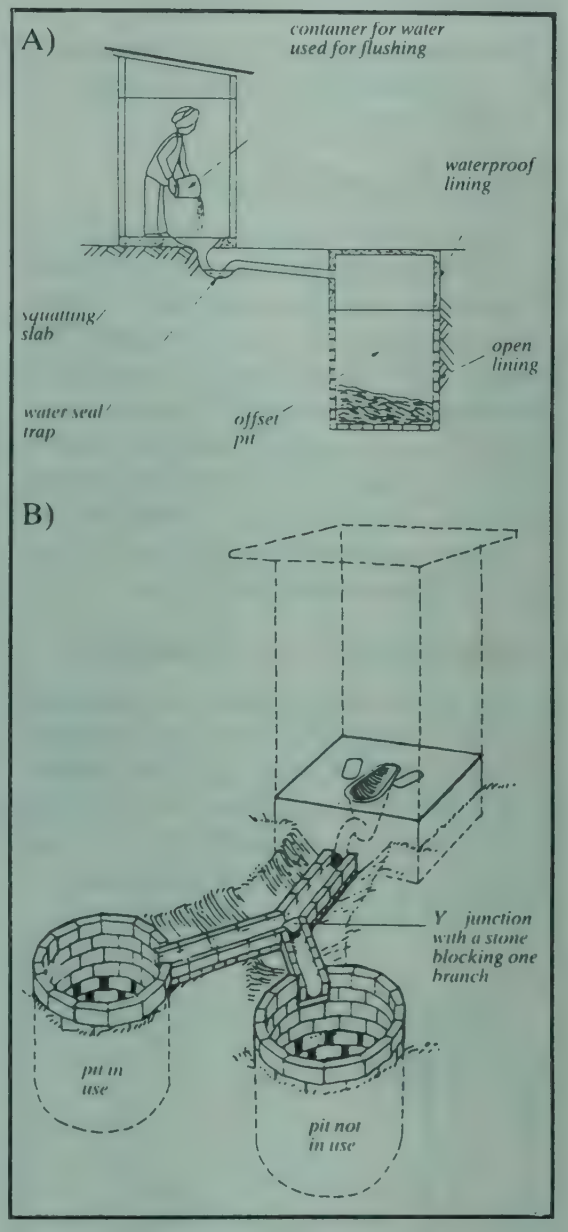
Good ventilation is important. Problems of bad smells and flies can be reduced if a vent pipe is installed. This should be at least 300 mm (0.3 metres) above the highest point of the hut, (except for conical roofs, where the vent pipe should go to at least the height of the apex). The movement of air across the top of the pipe will create an up-draught, drawing up smells from the pit, and trapping any flies under the mesh at the top of the pipe.

The mesh should be inspected every month to make sure it is properly secured, and that spiders' webs, flies and other debris are not blocking the vent pipe. These can be cleared by pouring water down the pipe.

Pour flush latrine

A) The pour-flush latrine has a squatting slab which is specially made to include a water seal trap, set into the floor. Excreta is flushed down a short length of pipe from the water seal trap with a small amount of water. The pit itself should be open lined at the bottom to allow the escape of liquids, while the top section should be waterproof.

B) Two pits can be dug side by side and connected to the latrine by a 'Y' junction. One arm of this junction is sealed at first, so that only one pit fills. When this pit is full, it is sealed and the second pit is used. By the time this pit is full, the contents of the first pit can be dug out and used as fertilizer. The advantage of this type of latrine is that it includes a water seal trap, so that fly-breeding in the pit, and odours are avoided.



Acknowledgements

The information contained in this insert is based on material from:

- Cairncross S., Feachem R., Small Excreta Disposal Systems. Jan 1978. Ross Bulletin No. 8. (LSTHM).
- IRC. Making the Links, Guidelines for Hygiene Education in Community Water Supply and Sanitation. July 1984.
- IRC – WHO Collaborating Centre. Practical Solutions in Drinking Water Supply and Waste Disposal for Developing Countries. Tech. Paper Series No. 20.
- Kilama W., Winblad U., Sanitation Without Water. 1985. TALC.
- Pacey A., Rural Sanitation: Planning and Appraisal. 1980. Intermediate Technology Publications.
- VITA, Village Technology Handbook. 1981.

WATER AND SANITATION

EXCRETA DISPOSAL

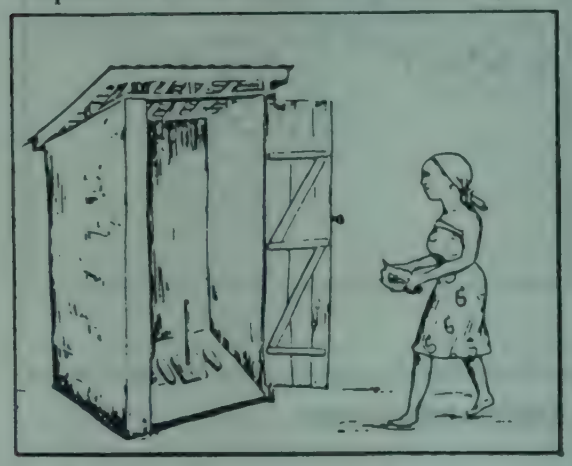
Safe excreta disposal is as essential as a safe water supply in preventing the spread of disease.

Where there is no latrine

If there is no latrine available, it is important to dispose carefully of faeces by burying – dig a small hole before passing stools (as far away as possible from houses, paths, animals and small children, and at least 10 metres away from the water supply), and cover with earth to prevent contact from flies and animals. Avoid going barefoot to defaecate, and do not allow children to visit the defaecation area alone.

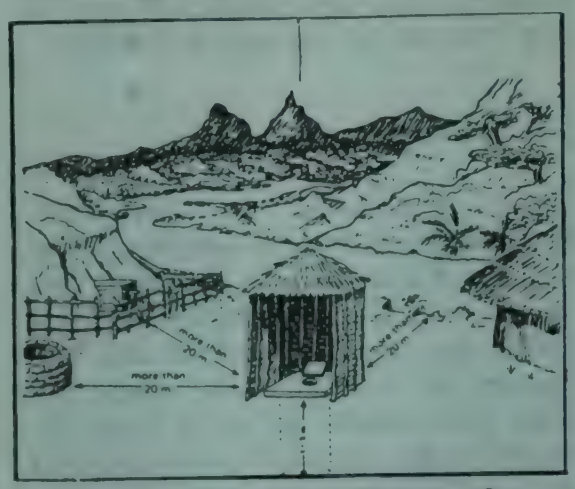
Children and excreta disposal

A common belief in many societies is that the faeces of babies and children are less harmful than those of adults. In fact the faeces of babies and young children are just as dangerous as those of adults. It is therefore important to dispose of these faeces in a safe way.



If children are too small, or are too scared of the squat-hole, to use a latrine, a separate children's latrine could be built or a hole in the ground at a convenient distance from the house made for them to use for defaecation. After each time it is used the faeces should be covered with soil. Another hole can be made when the first one is full. Another possibility is to get the child to use a potty, or to defaecate onto paper or a large leaf, which can then be put in the latrine.

Locating a latrine

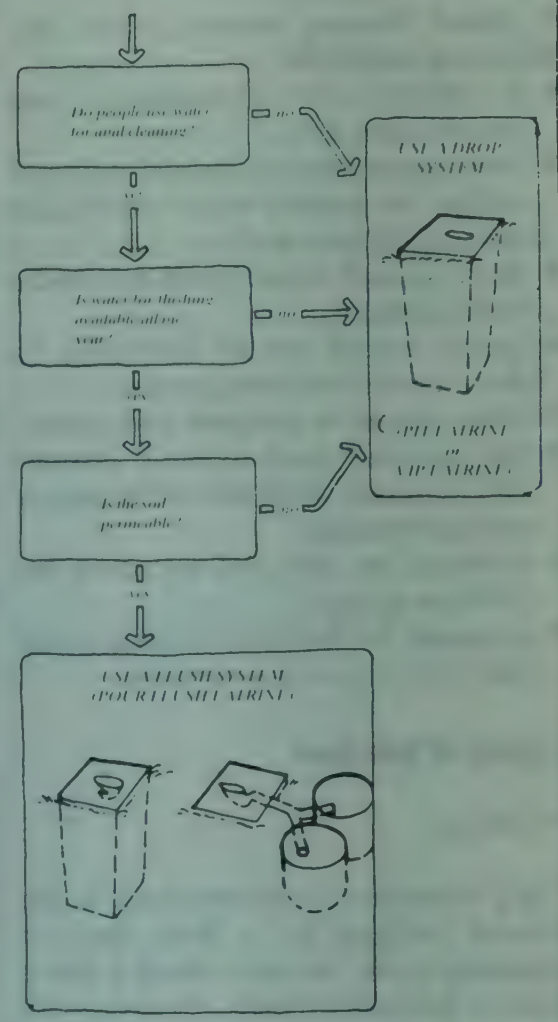


A latrine should be at least 15 metres from all wells, springs, rivers, or streams.

- If possible, the bottom of the latrine should be more than 1.5 metres above the highest groundwater table. If the bottom of the latrine is likely to be close to, or reach down into, the groundwater, then build it downhill from the water source. If you cannot place the latrine downhill, then it should be built at least 15 metres away from all houses, wells, springs, rivers or streams.
- A latrine site should be dry, well drained and above flood level.
- The latrine should be close to the home, if it is too far away, it is less likely to be used.

Choosing a latrine

Flush system or drop system?



If the answer to these questions is YES, select a flush system. If the answer to one of the questions is NO, choose a drop system.

LATRINE COMPARISONS

LATRINE	Rural application	Urban application	Cost to build	Ease of construction	Water requirement	Best anal cleaning material	Hygiene	Fertilizer production
Pit latrine	suitable in all areas	not in high density suburbs	low	simple — except in wet and rocky ground	none	any	moderate	can do
VIP Latrine	Suitable in all areas	not in high density suburbs	low	simple — except in wet and rocky ground	none	any	good	not easily
Pour flush latrine	suitable	not suitable	high	requires skilled builder	water source near privy	water	good	no

WATER AND SANITATION

PERSONAL HYGIENE

Good personal hygiene can prevent or reduce the incidence of diarrhoea, skin and eye diseases and body lice. One way to improve personal hygiene is to have plenty of water near people's homes.

This can be used for:

- washing hands after defaecation;
- washing hands before preparing and eating food;
- washing the faces and hands of children;
- bathing or body-washing;
- regular washing of the hair;
- washing of clothes and bedclothes;
- cleaning teeth.

Washing, especially hand washing, should be done whenever possible with soap. Where soap is not available for bathing, substitutes such as ash, clean sand, a flat stone, or a clean cloth to rub the body, could be used.

The importance of handwashing

Handwashing after defaecation will greatly help to reduce the risk of disease transmission.

In areas where anal cleansing with water is practised, the promotion of handwashing may create fewer problems than in areas where other cleansing materials are used. When anal cleansing is done with water it means that at least some water is available and that handwashing may be integrated more easily as a part of defaecation practice.

Handwashing can help to reduce the risk of disease transmission.

DOMESTIC HYGIENE

To prevent disease transmission:

- make sure that water containers, dippers and cups are clean to prevent the contamination of drinking water;
- wash cooking pots, dishes, eating utensils, carefully after each use. A rack drainer (to keep items above the ground) in the sun above a soakaway may be the best place to drain and dry washed articles. The water from washing can be emptied into the soakaway (waste water soakage pit);
- control flies not only by burying faeces and use of pit latrines but also by covering food and safely disposing of domestic waste;
- cover, bury or burn domestic waste to deter flies and rats.

RESOURCE LIST

SOURCES OF INFORMATION AND EQUIPMENT

- **African Medical & Research Foundation (AMREF),** P.O. Box 30125, Wilson Airport, Nairobi, Kenya.
- **Blair Research Institute,** Ministry of Health, P.O. Box 8105, Causeway, Harare, Zimbabwe.
- **Centre for Agricultural Mechanisation and Rural Technology (CAMARTEC),** P.O. Box 764, Arusha, Tanzania.
- **EARTHSCAN,** 3 Endsleigh Street, London, WC1, U.K.
- **ENDA TIERS MONDE,** B.P. 3370, Dakar, Senegal.
- **ENSIC,** P.O. Box 72461, Asian Institute of Technology, Bangkok, Thailand.
- **Environmental Liaison Centre,** P.O. Box 72461, Nairobi, Kenya.
- **Global Water Film Library,** Suite 500, 1629 K Street, NW, Washington, D.C. 20006, U.S.A.
- **Imperial College,** Department of Civil Engineering, University of London, London, SW7 3BU, U.K.
- **Intermediate Reference Centre for Community Water Supply and Sanitation (IRC),** P.O. Box 93190, 2509 AD, The Hague, The Netherlands.
- **Intermediate Technology Development Group,** Myson House, Railway Terrace, Rugby, CV21 3HT, U.K.
- **Intermediate Technology Publications,** 9 King Street, London, WC2E 8HW, U.K.
- **International Development Research Centre (IDRC),** Health Sciences Division, P.O. Box 8500, Ottawa, Ontario, Canada, KIG 3H9.
- **Kenya Water for Health Organisation (KWAHO),** P.O. Box 61470, Nairobi, Kenya.
- **London School of Hygiene and Tropical Medicine (LSHTM),** Department of Tropical Medicine, Keppel Street, Gower Street, London, WC1E 7HT, U.K.
- **National Demonstration Water Well Project,** US Agency for International Development, Development Information Centre, Washington, DC 20523, U.S.A.
- **National Environmental Engineering Institute (NEERI),** Nehru Marg, Nagpur 440 020, India.
- **National Water Council,** Overseas Manpower Development Group, James House, 27 London Road, Newbury, Berkshire, RH13 1JL, U.K.
- **Peace Corps,** Information Collection and Exchange, 806 Connecticut Ave, NW, Washington DC 20525, U.S.A.
- **Teaching Aids at Low Cost (TALC),** P.O. Box 49, St Albans, Herts AL1 4AX, U.K.
- **TOOL,** Entrepotdok 68a/69a, 1018 AD Amsterdam, The Netherlands.
- **UNICEF,** Water and Environmental Sanitation Team, and **United Nations Development Programme (UNDP),** United Nations, 1 U.N. Plaza, New York, NY 10017, U.S.A.
- **University of Birmingham,** Department of Civil Engineering, P.O. Box 363, Birmingham, B15 2TT, U.K.
- **Volunteers in Technical Development (VITA),** 1895 North Lynn Street, Arlington, VA 22209, U.S.A.
- **WASTE,** Consultants on Appropriate Technology, Crabethstratt 38f, 2801 AN, Gouda, Netherlands.
- **WATERAID,** 1 Queen Anne's Gate, London, WC1H 9BT, U.K.
- **Water and Sanitation for Health Project (WASH),** 1611 N. Kent Street, Room 1002, Arlington, Virginia 22209, U.S.A.
- **Water and Waste Engineering for Developing Countries (WEDC),** University of Technology, Loughborough, LE11 3TU, U.K.
- **World Bank,** Water Supply and Urban Development Department, 1818 H Street, NW, Washington DC 20433, U.S.A.
- **World Health Organisation (WHO),** CH-1211, Geneva 27, Switzerland.

BOOKS/MANUALS

Bush R.E., **Well Construction (Hand dug and Hand Drilled).** Peace Corps.

Cairncross S. and Feachem R., **Environmental Health Engineering in the Tropics.** 1983. John Wiley & Sons, Southern Cross Trading Estate, 1 Oldlands Way, Bognor Regis, PD22 9SA, U.K.

Chauhan S.K. et al., **Who Puts the Water in the Taps? Community Participation in Third World Drinking Water Sanitation and Health.** 1983. Earthscan.

Curtis, V., **Women and the Transport of Water.** 1986. Intermediate Technology Publications.

Glennie C., **A Model for the Development of a Self-Help Water Supply Programme.** 1982. Technology Advisory Group Working Paper. No. 1. World Bank/International Bank Reconstruction.

IRC. **Directory of Sources of Information and Documentation on Community Water Supply and Sanitation.** 1983.

IRC. **Hand Pumps.** Technical Paper Series 10. 1983.

Mara D., **The Design of Ventilated Improved Pit Latrines.** TAG. Technical Note 13. 1984. World Bank/-International Bank for Reconstruction.

OXFAM. **Water Packs Manuals.**

Pacey A & Cullis A., **Rainwater Harvesting (The Collection of Rainfall and Run-off in Rural Areas).** 1986. Intermediate Technology Publications.

UNICEF. **Solar Disinfection of Drinking Water & Oral Rehydration Solutions. Guidelines for Household Application in Developing Countries.** 1984. Palais de Nations, CH-1211, Geneval 10, Switzerland.

Van Wijk-Sijbesma C., **Participation of Women in Water supply and Sanitation (Roles & Realities).** 1985. Technical Paper 22, IRC.

WASH. **Information Exchange/Roster of Organisations Related to Water Decade.** 1983.

WHO. **Operation and Maintenance – Eight questions to ask.** 1983. Document No. ETS 83.9.

WHO. **Women, Water & Sanitation.** 1986.

Whyte A. **Guidelines for Planning Community Participation in Water Supply and Sanitation Projects.** Document No. (ETS/83.8) 1983. WHO.

Winblad U & Kilama W., **Sanitation Without Water,** 1985. TALC.

World Bank/International Bank for Reconstruction. **Ventilated Improved Pit Latrines, Guidelines for the Selection of Design Options.** TAG Paper 4. 1985.

FILMS & AUDIOVISUALS

A Drop of Water. (Slide set). Development Education Kit No. 11, 1981, UNICEF.

A Handle on Health. (Testing, Manufacture and Design of Low Cost Handpumps.) 16mm film. 27 minutes. 1985. IDRC.

For Want of Water. VHS, 28 minutes. £13.00 (inc. p & p surface mail). **Shell Film Unit,** Shell Centre, London, SE1 7NA, U.K.

Global Water Film Library. Extensive library of films and videocassettes on water and development.

Prescription for Health. English and French. 16mm video, colour, 23 minutes. 1983. IDRC.

Water Supply and Sanitation for Developing Countries. An international source list. 1987. Bernadette Carney, WHO.

NEWSLETTERS

IRC Newsletter. IRC.

Decade Watch. UNDP.

Water Aid News. WATER AID.

ENFO. Environmental Sanitation Information Centre (ENSIC).

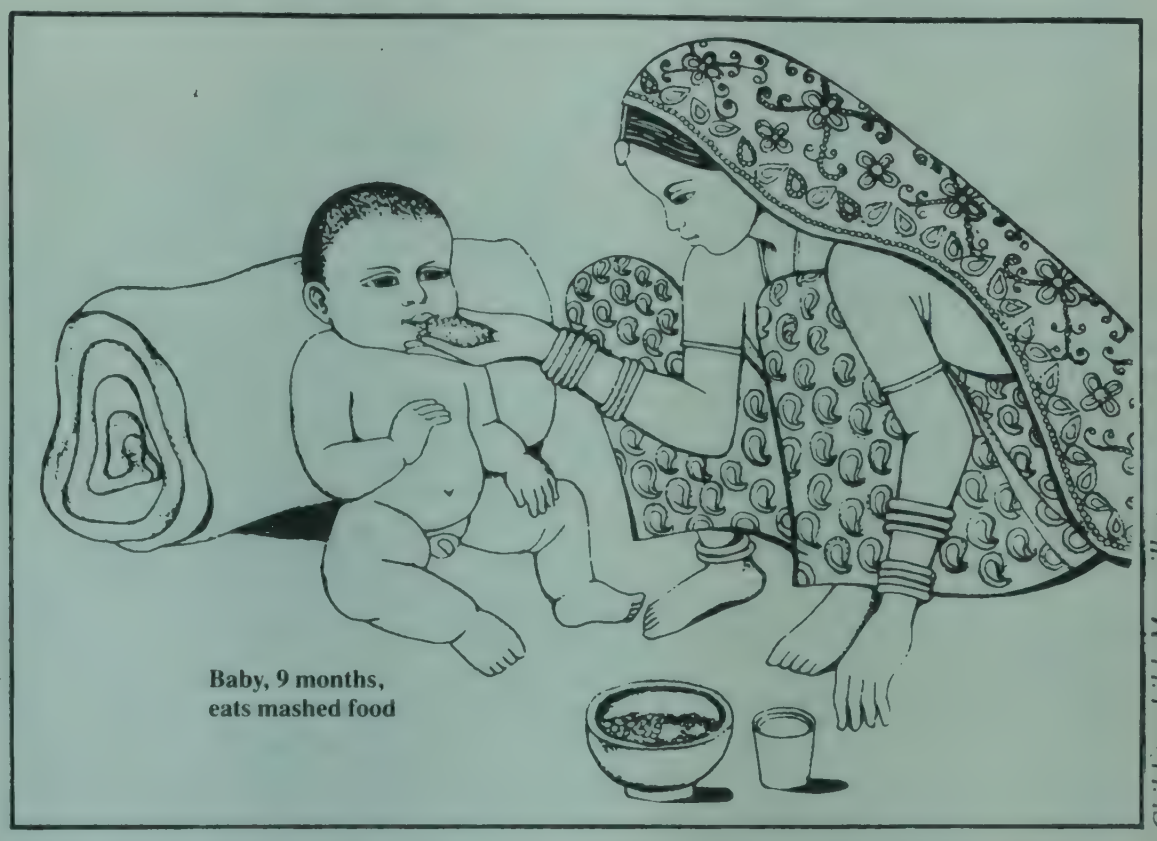
Waterlines. Intermediate Technology Publications.

Waterfront. UNICEF.

World Water. Thomas Telford House 1 Heron Quay, London, E14 9XF, U.K.

HEALTH BASICS: WEANING

Breastmilk is the best and safest food for young babies. Older babies need extra foods as well as breastmilk. It is important that babies are given extra foods as well as breastmilk at the right age, and in sufficient amounts, to enable them to grow and stay healthy. Too little food, given too late, or inadequate food with too few nutrients may lead to poor growth and malnutrition. The malnourished child will get sick more often and will be less able to fight off illnesses such as diarrhoea. Weaning foods can, however, be very dangerous for babies. If they are not hygienically prepared they can be a major source of infection. This Health Basics insert describes good weaning practices to help families prevent diarrhoea in their children.



Baby, 9 months, eats mashed food

Child-to-child, Macmillan

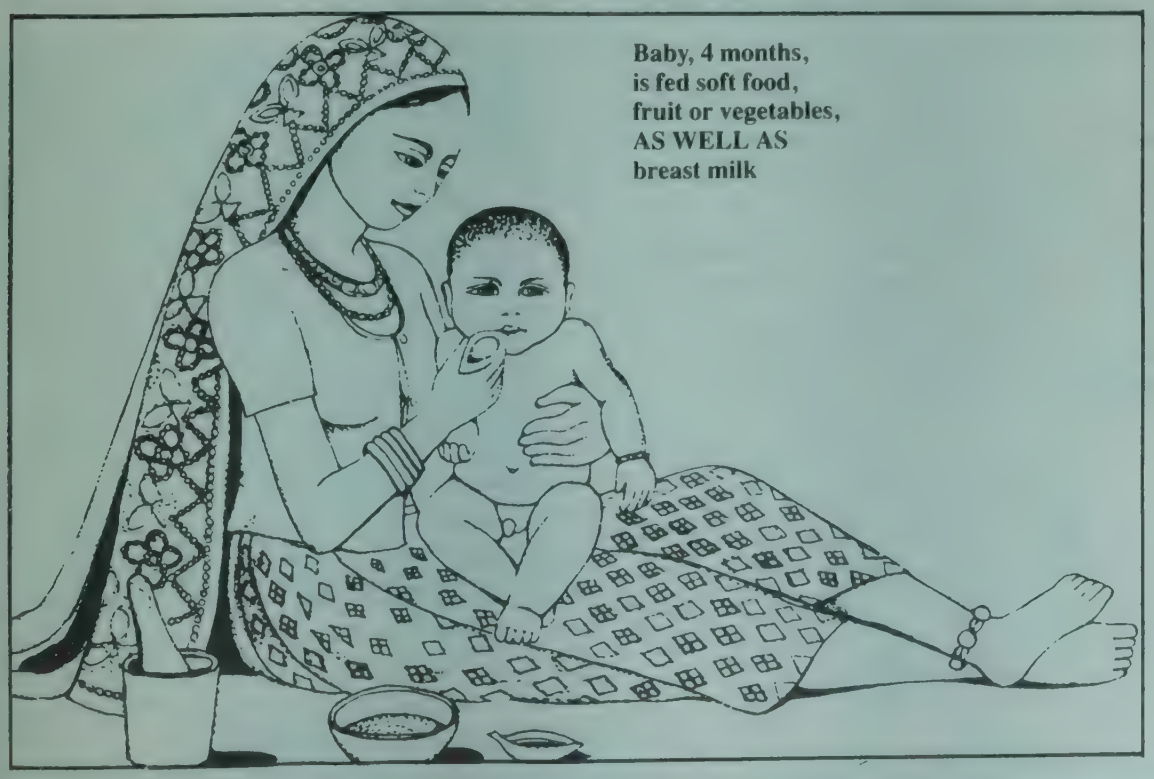
What is weaning?

Weaning means giving family foods in addition to breastmilk. Weaning is a gradual process by which the infant becomes accustomed to the adult diet.

It is not good for babies to stop giving breastmilk when new foods are first being given — weaning foods do not replace breastmilk, they complement it. As the baby gets older it needs more food to grow and stay healthy. The number of breastfeeds can be reduced slowly as the baby starts to eat more and more family foods. However, it is important to remember that until the age of about two years babies can still receive an important amount of nourishment from breastmilk.

When to start giving extra foods?

Weaning foods should be given to the baby at about the age of four to six months. At four months most babies start to need extra food in addition to breastmilk because they are growing fast and breastmilk is no longer enough.



Baby, 4 months, is fed soft food, fruit or vegetables, AS WELL AS breast milk

Child-to-child, Macmillan

How should weaning foods be given, and how often?

Start by giving one or two teaspoons a day of carefully mashed food in addition to regular breastfeeds. Do not use a feeding bottle. Slowly increase the number of meals and the amount of food given. By the age of eight months most babies need four 'meals' a day including a variety of foods, in addition to regular breastfeeding. At one year old a child should be able to be given all types of family foods, although the food may still need to be softened or mashed. At this age a child needs to eat about half the daily amount of food its mother eats.

Feed babies using a clean cup and spoon. Do not add water to the weaning food. Watered down weaning food does not have enough nutritional value, and if the water is dirty or contaminated the baby will probably get diarrhoea. Patience is needed when babies are first starting to eat family foods — while they are learning to eat this way they may often spit out the food — this does not mean that they are

WEANING

not hungry. Let the baby get used to one food for a few days before introducing another.

Weaning foods should ideally be:
- high in energy;
- easy to digest;
- low in bulk and viscosity (not too thick);
- fresh and clean;
- inexpensive and easy to prepare;
- not too highly seasoned.

What are good weaning foods?

A thick creamy porridge made from the basic food of the community is a good weaning food for babies. The basic food or staple is cheaper than most other foods and is usually eaten by the family at most meals. Examples of basic foods include:

- *cereals* — maize
  — wheat
  — sorghum
  — oats
  — barley
  — bread (soaked in gravy, milk, or tea)
  — rice
- *roots* — cassava
  — yam
  — cocoyam
  — potato
  — sweet potato
- *starchy fruits* — plantain
  — breadfruit
  — banana

On their own, especially when cooked in water, most cereals, grains and roots are too low in energy. Some oil or fat (or sugar) should be added to the porridge to make it richer and easier to swallow and digest. Adding oil increases the energy value of the weaning porridge.

Give this porridge in addition to breastmilk for about two weeks — after this time babies need other foods as well as breastmilk and porridge to provide enough energy and a balanced diet. It is important that weaning foods contain oils, fats or sugars; fruits; dark green vegetables or orange or yellow fruits; and food from animals or fish or from legumes (for example lentils). These different types of food provide energy; vitamins; and proteins. The best type of weaning meals should contain something from all of these groups. Continue to give breastfeeds regularly between meals.

Examples of types of foods from these groups are:

- *peas and beans*

These are as good as food from animals for providing protein but are cheaper. They need to be cooked thoroughly and mashed to make them easily digestible for babies. Examples include chickpeas, cowpeas, groundnuts, soya beans, split peas, lentils, blackeye beans, peanuts, red beans, navy beans.

- *food from animals and fish*

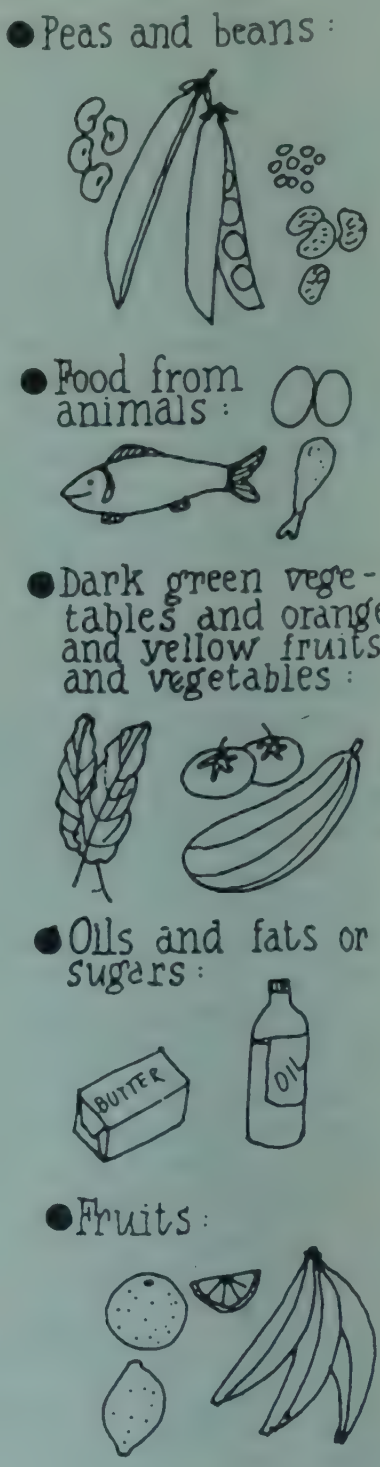
These are good for babies but are usually more expensive than peas and beans. Examples include meat, fish, offal, eggs, milk, and food made from milk such as cheese and yoghurt, curd, cottage cheese.

- *dark green leafy vegetables, and orange and yellow vegetables and fruits*

Babies need these foods to prevent eye damage and possibly blindness from shortage of Vitamin A. Examples include: spinach, kale, tomatoes, carrots, amaranth, sweet cassava, pumpkin leaves, calalu, pumpkin and pawpaw.

- *oils, fats or sugars*

These add extra energy to the weaning porridge or cereal dishes. Sugars are not as good as oils or fats and will also damage teeth. Examples include: corn, palm, groundnut, coconut and sunflower oils, ghee, butter, margarine, lard, any animal fat.



- *fruits*

Before giving these to babies they should be peeled carefully or washed in clean water, then mashed or the juice squeezed out. If water is added to the juice it must be clean; otherwise babies may get diarrhoea. Examples include: oranges, pumpkin, tomato, banana, papaya, mango, pineapple.

Illustrations from Learn More about Breastfeeding and Weaning, League of Red Cross and Red Crescent Societies

WEANING

Food from the family pot

Family foods, that is foods that the rest of the family normally eat can give babies all the nourishment they need without any additional cost. There is no need to buy expensive commercially manufactured weaning foods. Talk to mothers about what the family usually eats and help them to decide which foods would be suitable to give a young baby. Family pot feeding — giving the family food in a mashed form, without or before adding hot spices or extra salt, and adding something extra like oil, an egg, and extra dark leafy vegetables — is best. Put the child's food in a separate dish or bowl so that it is possible to see how much he or she eats. Also make sure that the bowl or plate and utensils used by the child are clean. This also encourages the child, as it gets older to learn to feed itself. Make sure that the child's hands are clean.

Photo by N. Rehman (UNICEF)

Use the cleanest water available for weaning foods and for washing uncooked food.

Cooking weaning foods

Cooking equipment, particularly stoves, plays a vital role in the health of the family or community. Safe, economical stoves are essential to provide heat and light and to cook safe and nutritious meals.

A good cooking stove helps to ensure that weaning foods are well cooked and properly reheated. A stove should be:

- safe (so that children do not burn or scald themselves);
- easy to use and suitable for frequent use;
- fuel efficient, i.e. should not waste or use too much fuel, or produce too much smoke;
- be capable of cooking and reheating food thoroughly and boiling water using minimal fuel and time.

ICDDR, B Photo

Careful preparation of weaning foods helps to prevent diarrhoea.

Food that has not been cooked or reheated thoroughly may contain diarrhoea-causing germs (pathogens). Cooking food thoroughly so that it boils can make it safe by destroying these pathogens (e.g. bacteria and parasitic eggs). Cooking food can also improve its flavour, making it more palatable for children, and the addition of other ingredients can increase the nutritional value of the food. (Badly or over-cooked food on the other hand can cause loss of nutrients and contribute to malnutrition). Cooking food also makes it easier to chew and digest and helps the body to absorb nutrients from it.

Preparing weaning foods

Contaminated weaning foods give babies diarrhoea. Careful preparation and storage of weaning foods keeps them safe. Follow these rules for safe preparation of weaning foods:

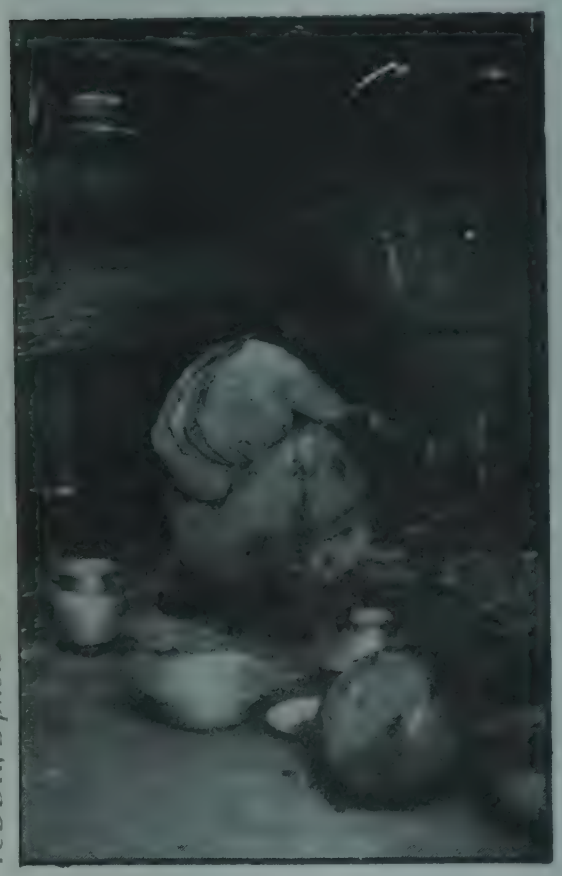
- wash hands before preparing food;
- if possible prepare weaning foods immediately before they will be eaten;
- wash all utensils before preparing food, and scrub chopping boards and tables;
- cook or boil food well;
- reheat food thoroughly if it has been kept for more than two hours, until it boils. Boiling food will kill any germs that may have contaminated the food while it has been stored. Let it cool before giving it to the baby;
- mash foods up with a clean pestle, fork or spoon. Never use a sieve as these are difficult to keep clean;
- use the cleanest water available for making weaning foods and for washing uncooked foods. If possible boil

WEANING

the water if it has not come from a clean source such as a tap or water pump. Boiling water will kill the germs that cause diarrhoea.

Storing weaning foods

- Do not store weaning foods for more than two hours if possible. Keep them stored in clean covered containers that keep out flies and other insects.
- Keep in a cool shady place out of direct sunlight if possible.
- If food has been kept for more than two hours reheat it thoroughly so that it boils.



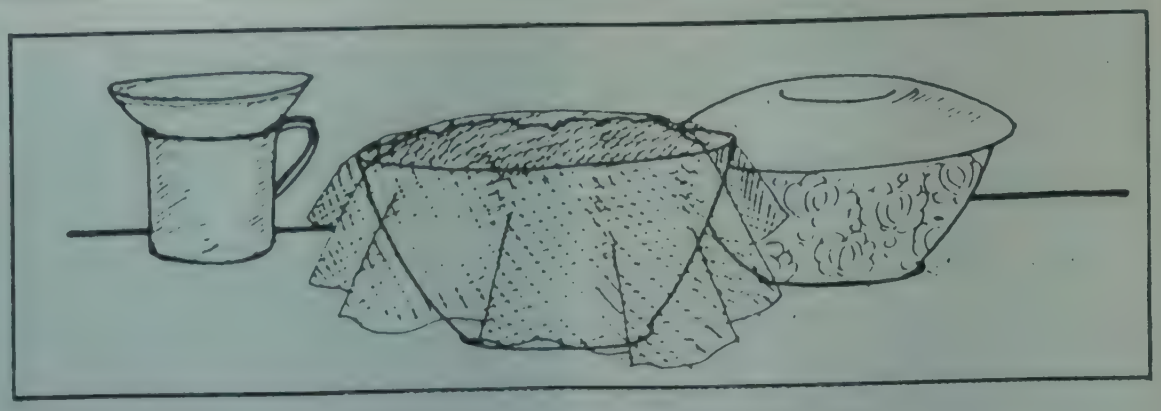
ICDDR, B photo

Keep food in a cool shady place.

Personal hygiene and weaning foods

Hands should be washed before preparing weaning foods and before feeding them to the baby, particularly after using the latrine. Unwashed hands can pass on diarrhoea germs via food to the baby. Mothers should be especially careful to wash their hands, with soap if available, after cleaning their baby's bottom.

Remember: *cool, covered, clean cooked food is safe food* **but** *faeces, flies, filth, fingers can mean dirty unsafe food.*



Why do weaning age babies get malnourished?

This is usually because:

- they are not given the right sort of weaning foods or enough food;
- they grow very fast and need plenty of energy rich foods — more for their size than older children or adults;
- they may be taken off the breast too early, or suddenly, i.e. as soon as extra foods are given;
- they have small stomachs and do not get food often enough. Two or three meals a day like the rest of the family is not enough for the weaning age baby;
- they do not have enough teeth to chew, and need food that is soft and easy to swallow.

Why do weaning age babies often get diarrhoea?

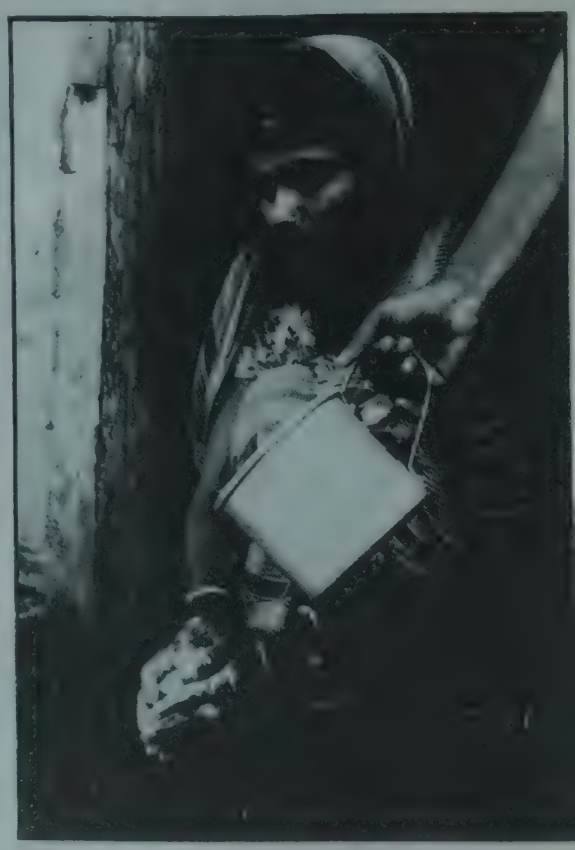
- After four to six months of age babies have lost some of the protection against disease given to them by their mothers at birth (maternal antibody) and from breastmilk.
- They may also get diarrhoea from the new foods that they are being given if these are prepared or given to the baby with dirty hands and utensils. Food that is not stored safely, but which is left uncovered and open to dirt and flies, or kept in dirty containers, will quickly go bad, become contaminated and may give babies diarrhoea.
- Also at this age babies start to move around more, put things in their mouths, and are more likely to come into contact with germs and dirt. However, they are too young to have built up much immunity themselves to protect them against diseases such as diarrhoea.

The weanling with diarrhoea

As at any other age, the weanling with diarrhoea must be given plenty of appropriate fluids and continue to eat plenty of nourishing food to help recovery and ensure that there is no growth retardation.

Weaning education

Before talking to mothers about which weaning foods to give, you will need to be aware of the family's socio-economic status, and availability of different types of foods, particularly those which are seasonal. Some existing beliefs about foods and feeding are beneficial, others may be more harmful, but make suggestions tactfully and explain how a weaning diet can be made more nutritious using local foods. In many places you may also need to win over the support of the grandmother if you



Hands should be washed before preparing weaning foods.

WEANING

Photo by Carolyn Watson

Remember that no two babies are the same in which foods they like more than others.

Home and community weaning food production

This can be done:

- at home using a cereal staple plus legume/seed/nut mixture. The mixture should be easily reconstituted and should have a shelf life of at least one week (simple grinding devices to reduce the time and work involved are recommended); or
- at community level through community groups. Women's groups can initiate and operate communal production/income generating activities which may or may not be subsidised. The use of oils, pineapple juice, papaya juice and fermentation methods as well as germination can decrease the viscosity of weaning foods. Community level activities should have an educational and health component and should be integrated into, for example, children's supplementary feeding programmes.

There are several approaches to decreasing the viscosity and bulk of weaning food. Fermenting sorghum produces enzymes which decrease viscosity, as used in Tanzania. In South India, fermentation of rice and legumes is used to decrease viscosity. With bulky staple foods common in Asia and Africa, a small child would have to consume about 1 kilogramme of cooked rice or cooked banana to obtain only 1,000 calories. Small children cannot cope with such enormous quantities of staple foods to meet their energy needs. More energy dense, less bulky, low viscosity foods for young children should be promoted.

are to change what mothers feed to their young children.

For example, there are, in India, beliefs about the digestibility of certain foods and their consistency. Far too often watery gruels or lentil water or thin vegetable soups are given in the belief that the baby will not be able to digest anything else. But these have no or very little energy value. Beliefs in 'hot' and 'cold' foods or, for example, that cereals are bad for the liver, should not be condemned, but can be overcome with patience and alternatives suggested. Many mothers believe that their baby needs expensive or special foods, which they cannot afford. They may also ask how the child can eat proper food before it has any teeth. Emphasise that this is not a problem if the food is properly mashed and soft.

Feeding the weaning child

Points to remember

- Feeding is a matter of using good sense. Like adults, babies may like a particular food more than another, and may be more hungry on some days than others. No two babies are the same in which foods they like more than others. Some babies prefer sweet things while others prefer salty things. Make allowances for this.
- Mealtimes should be pleasant and 'force' must not be used in feeding. Remember that learning to swallow semi-solid food may be difficult for a baby who only knows how to suck the breast.
- If a particular food is refused, do not offer it again for a few days. Try something different.

Acknowledgements

This DD insert is based on an article by Dr Shanti Ghosh and material from:

- Learn More About Breastfeeding and Weaning. League of Red Cross and Red Crescent Societies 1987.
- Primary Health Care Technologies at Family and Community Levels. Aga Khan Foundation, UNICEF, WHO, 1986.
- Feeding Mother and Child. The Caribbean Food and Nutrition Institute.
- Prevention of Diarrhoea. Supervisory Skills. WHO, 1987.

RESOURCE LIST

Addresses for organisations supplying books/manuals, audiovisuals, and newsletters, are listed under sources of information and materials.

SOURCES OF INFORMATION AND MATERIALS

- **American Public Health Association,** International Health Programmes, 1015 Fifteenth Street, N.W., Washington, D.C. 20005, USA.
- **Caribbean Food & Nutrition Institute,** PO Box 140, Kingston 7, Jamaica.
- **Child-to-child Programme,** Rm 833, Institute of Education, 20 Bedford Way, London WC1 0AL. UK.
- **Clearinghouse on Infant Feeding & Maternal Nutrition,** American Public Health Association, 1015 Fifteenth Street, N.W. Washington, DC 20005, USA.
- **Find Your Feet,** 13-15 Frognal, London NW3. UK.
- **Intermediate Technology Publications Ltd.,** 103-105 Southampton Row, London WC1B 4HH. UK.
- **International Nutrition Communication Service (INCS),** Education Development Centre, 55 Chapel Street, Newton, MA. 02160, USA.
- **Institute of Nutrition & Food Sciences,** University of Dhaka, Dhaka 2, Bangladesh.
- **International Children's Centre,** Chateau de Longchamp, Bois de Boulogne, F75016, Paris, France.
- **League of Red Cross & Red Crescent Societies,** 17 Chemin des Crêts, P.O. Box 372, 1211 Geneva 19, Switzerland.
- **London School of Hygiene & Tropical Medicine,** Department of Human Nutrition, Keppel Street, London WC1 7HT. UK.
- **Macmillan Press Ltd.,** Houndmills, Basingstoke, Hampshire RG21 2XS. UK.
- **National Food & Nutrition Committee,** PO Box 2223, Government Buildings, Suva, Fiji.
- **Nutrition Foundation of India,** B 37 Gulmoher Park, New Delhi, India.
- **Nutrition Foundation of the Philippines, Inc.,** 107 E, Rodriguez Sr., Boulevard, Quezon City, PO Box 3, Philippines.
- **National Institute of Nutrition,** Indian Council of Medical Research, Hyderabad 500 007, India.
- **Ministry of Health, Nutrition Section,** Box 2084, Konedobu, Papua New Guinea.
- **Oxford University Press,** Walton Street, Oxford OX2 6DP.
- **Teaching Aids at Low Cost (TALC),** PO Box 49, St. Albans, Herts. AL1 4AX.
- **Tanzania Food & Nutrition Centre,** Box 977, Dar es Salaam, Tanzania.
- **UNESCO, Nutrition Education Programme,** 7 Place de Fontenoy, 75700. Paris, France.
- **UNICEF,** UN Plaza, 4/1234C, New York 10017, USA.
- **Urban Resource Systems,** 783 Beuna Vista West, San Francisco, CA 94117, USA.
- **Voluntary Health Association of India (VHAI),** 40 Institutional Area, South of IIT, New Delhi — 110 016, India.
- **World Health Organisation (WHO),** Nutrition Unit, 1211 Geneva 27, Switzerland.
- **World Federation of Public Health Associations** (c/o American Public Health Association, USA)
- **World Neighbors,** 5116 North Portland Ave, Oklahoma City, OK 73112, USA.

BOOKS/MANUALS

Cameron M & Hofvander Y. **Manual on Feeding Infants and Young Children.** Oxford University Press. 1983

Child-to-child Programme. **Child-to-child Reader: Good Food.**

Caribbean Food & Nutrition Institute (CFNI). **A Guide to Feeding the Weaning Age Group in the Caribbean**. 1982 and **Improving Weaning Practices in the Caribbean. Self Learning Modules for Community Workers.** 1986.

Ebrahim G.J. **Nutrition in Mother and Child Health.** Macmillan. 1983.

Ghosh S. **The Feeding and Care of Infants and Young Children.** Voluntary Health Association of India (VHAI). 1985.

Hollis C. **Using Communications To Solve Nutrition Problems.** International Nutrition Communication Service. (INCS) 1986.

Israel R., & Lamptey P. **Nutrition Training Manual Catalogue for Health Professionals, Trainers and Field Workers in Developing Countries.** (INCS).

Joint WHO/UNICEF Nutrition Support Programme. **JNSP Nutrition Learning Packages, Package 4: Young Child Feeding.**

League of Red Cross & Red Crescent Societies. **Learn More About Breast Feeding & Weaning.** 1987.

Nutrition Handbook for Community Workers in the Tropics. Macmillan/CFNI. TALC, UK. 1986.

Pacey A. **Gardening for Better Nutrition.** Intermediate Technology Publications. 1978.

Proceedings First Asian Household Nutrition Appropriate Technology Conference. Colombo, Sri Lanka. UNICEF 1981.

Ritchie J.A.S. **Nutrition & Families.** Macmillan. 1983.

Royal Tropical Institute, Mauritskade 63, 1092 AD Amsterdam, The Netherlands. **Ready-made Weaning Food Mixtures in Developing Countries.** 1983.

De Sweemer C., *et al* **Manual for Child Nutrition in Rural India.** VHAI.

Tregoning M.A., & Bova G.S. **Better Child Care.** TALC, UK.

UNESCO, Nutrition Education Series. Issue 10. **Easy to Make Teaching Aids for Nutrition Teaching Learning.** 1984.

UNICEF. **The UNICEF Home Gardens Handbook — For People Promoting Mixed Gardening in the Humid Tropics.**

Wade I. **City Food Crop Selection in Third World Cities.** Urban Resource Systems. 1986.

World Federation of Public Health Associations. **Programmes Activities for Improving Weaning Practices.** Information for Action Issue Paper. 1984.

WHO. **Guidelines for Training Community Health Workers in Nutrition.** WHO Offset Publication. 2nd Edition, 1986.

Nutrition Educational Materials Listing. WHO. 1984.

Show and Tell. Nutritional Educational Programme. UNESCO. 1985.

AUDIOVISUALS

Videos

How to Wean Your Baby. A 20 minute video cassette & slide/audio cassette. 1986. CFNI.

Lucky Gary. A 10 minute video on weaning aimed at eastern Caribbean audiences. CFNI.

Slides

Weaning Foods & Energy. TALC, UK.

Filmstrips

Filmstrips available on feeding babies suitable for audiences in Guatemala, Nepal, Philippines. World Neighbors, USA.

Flipchart

Infant Care & Feeding. World Neighbors, USA.

Flannelgraph

Series includes: **Feed Your Children Often, Give Your Child Plenty of Soup.** TALC, UK.

NEWSLETTERS

Bulletin of the Nutrition Foundation of the Philippines. Nutrition Foundation of the Philippines. *Bi-monthly, English & Tagalog, Subscription.*

Cajanus Magazine, Caribbean Food & Nutrition Institute. *Quarterly, English, Subscription.*

The Fiji Food & Nutrition Newsletter, The National Food & Nutrition Committee. *Fiji, English, Subscription.*

Nutrition, Division of Nutritional Sciences, Cornell University, USA. *English, Free.*

Nutrition & Development. Ministry of Health, Papua New Guinea. *Quarterly, English, Subscription.*

Nutrition News. National Institute of Nutrition, India. *English, Free.*

Nutrition News, Institute of Nutrition and food sciences, Bangladesh. *Quarterly, English, Subscription.*

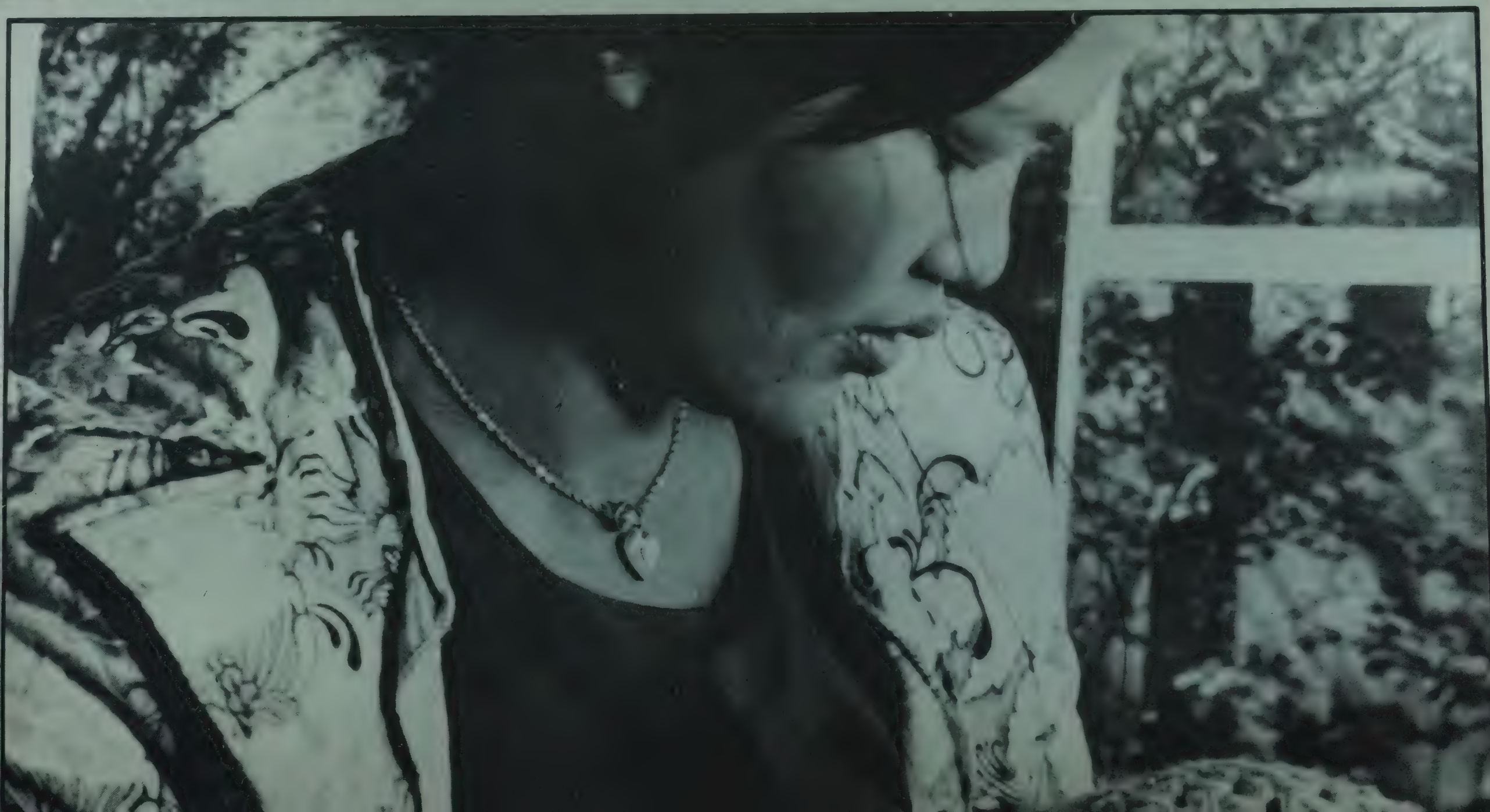
Mothers & Children. American Public Health Association. *English, French, Spanish, Free.*

Tanzanian Food & Nutrition Journal. Tanzanian Food & Nutrition Centre, Tanzania. *English, Subscription.*

Vitamin A + Sieve, Rodale Press Information Services, 33E, Minor Street, Emmaus, PA 18098, U.S.A. *English, Free.*

Xerophthalmia Club Bulletin. 31 Observatory Street, Oxford, U.K. *English, Free.*

BEST FOR BOTH



How to have plenty of milk

- Breastfeed often
- Start breastfeeding as soon as possible after birth. Most babies can suck well right after being born. The baby needs your colostrum to be healthy.
- Breastfeed the baby whenever he is hungry. This may be ten or more times each day. The more the baby sucks, the more milk you will produce.
- Night feeding helps you to develop a good milk supply. Keep the baby close to you at night.
- Give both breasts every time you breastfeed. Let the baby suck as long as he wants.
- Do not give glucose water or other milk from a bottle between breast feeds. If you think that you do not have enough milk, give extra breast feeds to increase your milk production. Do not give other foods instead of breast milk.

Take care of yourself

- Be sure you drink plenty of liquids every day.
- Eat extra food to make more milk.
- Rest whenever you can. Sometimes, breastfeed lying down.
- Use family planning to space your children.

Do not worry

- Do not worry about days when the baby cries more than usual. Comfort him by letting him suck.
- Do not worry about small or soft breasts. You can still produce plenty of milk. **It will flow when your baby sucks hard.**

PRODUCED BY DIARRHOEA DIALOGUE WITH THE BREASTFEEDING INFORMATION GROUP, KENYA